Manual for Investigation and Control of Communicable Diseases in New Mexico

New Mexico Department of Health
Epidemiology and Response Division
The purpose of this manual is to provide guidance to New Mexico Department of Health (NMDOH) personnel working on the prevention and control of selected infectious diseases of public health significance. In addition to chapters providing condition-specific information, Appendices 1-8 provide additional reference material.

Disclaimers:

- Specific circumstances surrounding a public health incident or notifiable condition may require modification of recommendations provided in this manual.
- Alternative diagnoses may need to be considered when determining case status.
- There may be additional or updated information available from other sources since this manual was last updated.
- Therapy sections are only meant to provide general background information, are subject to change, and should not be used for any decision-making purposes which are left exclusively to health care providers.

The Epidemiology and Response Division is responsible for directing investigations of specified infectious diseases and outbreaks that may impact the public. NMDOH staff, including those with clinical licenses, epidemiologists, disease prevention specialists, and others coordinate investigations with employees of other state agencies, local environment departments, tribal nations and agencies that serve them, healthcare personnel, and others as indicated. NMDOH has the capacity to conduct multiple investigations of specified infectious diseases and outbreaks simultaneously and each situation is analyzed on a case-by-case basis through situational analysis teams and processes.

Consultation with an epidemiologist in the Epidemiology and Response Division is available 24 hours per day/7 days per week/365 days per year by calling 505-827-0006.
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Botulism

Summary

Botulism is a neuroparalytic disorder characterized by an acute, afebrile, symmetric descending flaccid paralysis. Although rare, botulism is a serious illness caused by a nerve toxin produced by the bacterium *Clostridium botulinum*.

There are six kinds of botulism:

- **Foodborne botulism** can happen by eating foods that have been contaminated with botulinum toxin. Common sources of foodborne botulism are homemade foods that have been improperly canned, preserved, or fermented. Though uncommon, store-bought foods also can be contaminated with botulinum toxin.

- **Wound botulism** can happen if the spores of the bacteria get into a wound and make a toxin. People who inject drugs have a greater chance of getting wound botulism. Wound botulism has also occurred in people after a traumatic injury, such as a motorcycle accident, or surgery.

- **Infant botulism** can happen if the spores of the bacteria get into an infant’s intestines. The spores grow and produce the toxin which causes illness.

- **Adult intestinal toxemia** (also known as adult intestinal toxemia) botulism is a very rare kind of botulism that can happen if the spores of the bacteria get into an adult’s intestines, grow, and produce the toxin (similar to infant botulism).

- **Iatrogenic botulism** can happen if too much botulinum toxin is injected for cosmetic reasons, such as for wrinkles, or medical reasons, such as for migraine headaches.

- **Inhalational botulism** has recently been described. To date, the only human cases have been the result of inadvertent inhalation of toxin by laboratory workers. However, aerosolization and inhalation of botulinum toxin is considered a possible method for poison delivery in a bioterrorist attack.

All forms of botulism can be fatal and are considered medical emergencies. If you or someone you know has symptoms of botulism, see your doctor or go to the emergency room immediately. Foodborne botulism is a public health emergency because other people could eat a contaminated food.

Signs and symptoms in an adult may include:

- Double vision
- Blurred vision
- Drooping eyelids
- Slurred speech
- Difficulty swallowing
- Dry mouth
- Muscle weakness/descending paralysis
- Difficulty breathing/shortness of breath

Possible signs and symptoms in foodborne illness may also include:
• Abdominal pain
• Nausea
• Vomiting
• Diarrhea

Signs and symptoms in an infant may include:
• Poor feeding
• Diminished suckling and crying ability
• Neck and peripheral weakness ("floppy baby")
• Constipation
• Respiratory failure

If untreated, illness might progress to cause descending paralysis of respiratory muscles, arms, and legs.

Agent

Botulinum toxin is produced by Clostridium botulinum, a gram-positive bacillus which is a spore-forming obligate anaerobe. Botulism occurs after absorption of botulinum toxin into circulation from a mucosal or wound surface. The toxin irreversibly blocks presynaptic release of acetylcholine at the neuromuscular junction causing flaccid paralysis and cranial nerve dysfunction. Botulinum toxin is broken into eight neurotoxins (labeled as types A, B, C [C1, C2], D, E, F, G and, most recently discovered in 2013, H). Human botulism is caused mainly by types A, B, E, and (rarely) F. Types C, D and E cause illness in other mammals, birds and fish. The majority of foodborne cases in the western United States (US) are caused by type A; type B causes the majority of cases in the eastern US; type E causes most cases of foodborne botulism in Canada and Alaska which are associated with native foods; and type F causes rare foodborne cases in the US. C. botulinum types A, B and E have been identified in wound botulism cases.

Transmission

Reservoir:

Botulinum spores are ubiquitous in soil and may be recovered from agricultural products, including honey.

Mode of Transmission:

• Foodborne botulism occurs when a person ingests botulinum toxin, which leads to illness within a few hours to days. Outbreaks of foodborne botulism have the potential to be a public health emergency because the contaminated food may be eaten by other people. A frequent source is home-canned foods prepared in an unsafe manner.

• Infant botulism occurs each year in a small number of susceptible infants who harbor C. botulinum in their intestinal tract. It occurs when an infant ingests spores of C. botulinum, which in turn colonize the intestinal tract and produce toxin.

• Wound botulism is a rare disease that occurs when wounds infected with C. botulinum secrete the toxin. Wound botulism has been reported among illicit drug users (especially
those using black tar heroin) from subcutaneous injections contaminated with spores or from cocaine inhaled into a sinus followed by germination, vegetative growth, and toxin production. It has also been seen in cases of traumatic injury, such as motorcycle crashes, and surgeries.

- Adult intestinal colonization (also called adult intestinal toxemia) is an even rarer type of botulism. It involves intestinal colonization in a person older than one year of age. In the small number of these cases, most patients had a history of gastrointestinal surgery or illness, such as inflammatory bowel disease, which might have predisposed them to enteric colonization. No other specific risk factors have been identified.

- Iatrogenic botulism occurs after an overdose of injected botulinum toxin for cosmetic or medical purposes

- Inhalational botulism occurs from the inadvertent inhalation of toxin by laboratory workers.

Period of communicability:
Not transmitted person to person.

Clinical Disease

Incubation Period:
- Foodborne botulism: usually 12 to 48 hours after eating contaminated food, but can occur as early as 6 hours or as late as 8 days.
- Wound botulism: 4 to 14 days between time of injury, injection, or inhalation and onset of signs and symptoms.
- Infant botulism: estimated at 3 to 30 days from exposure to spore-containing food.

Illness:

Cranial nerve palsies always occur in botulism.

Foodborne botulism is characterized by acute bilateral cranial nerve dysfunction and descending weakness or paralysis. Early signs and symptoms can include: ptosis (drooping eyelids), double vision, blurred vision, dry mouth, dysarthria (difficulty in articulating words), dysphonia (difficulty talking, muffled speech), and dysphagia (difficulty swallowing, eventually aspiration). Symmetrical voluntary muscle weakness progresses from difficulty with head control to weakness of upper extremities then lower extremities. Cognitive function is normal despite fatigue and apparent lethargy. Fever is absent unless secondary infections develop.

Wound botulism develops into a similar clinical picture after the organism contaminates a wound, although these patients may have little evidence of acute wound infection.

Infant botulism typically presents with constipation, lethargy, difficulty feeding and swallowing, ptosis, loss of head control, and muscle weakness. Prolonged paralysis and intubation frequently lead to secondary infections. When death occurs, it is primarily due to respiratory failure.

Laboratory Diagnosis

Initial diagnosis of botulism should be based on clinical signs and symptoms. Treatment should not wait for laboratory confirmation. Laboratory confirmation is done by demonstrating the presence of botulinum toxin in serum, stool, or food, or by culturing C. botulinum, C. butyricum, or C. baratii from stool, a wound, or food.
Other tests and laboratory studies to help with clinical diagnosis include:

- **Routine lab tests (CBC, electrolytes, LFTs, urinalysis):** Generally not helpful in diagnosis as these tests show no characteristic abnormalities.

- **Cerebrospinal fluid (CSF) studies:** Essentially normal, although occasionally a borderline elevation in protein level may be seen.

- **Tension test:** A normal test helps to differentiate botulism from myasthenia gravis; borderline positive tests can occur in botulism.

- **CTs and MRIs:** Normal CTs and MRIs help to rule out cerebrovascular accident (CVA.)

Persons with suspected botulism should have serum and stool collected for analysis. (Because the toxin may enter the blood stream through the eye or via small breaks in the skin, caution is warranted during specimen collection.)

- **A mouse neutralization bioassay confirms botulism by isolating the botulism toxin.** Toxin may be identified in serum, stool, vomitus, gastric aspirate, and suspected foods.

- **C. botulinum** may be grown on selective media from samples of stool, wound exudates or foods. Note that the specimens for toxin analysis should be refrigerated, but samples for cultured **C. botulinum** should not be refrigerated.

- **Because intestinal carriage is rare, identifying the organism or its toxin in vomitus, gastric fluid, or stool is strongly suggestive of the diagnosis.**

- **Isolation of the organism from food without toxin is insufficient grounds for the diagnosis.**

**Treatment**

Treatment of botulism should begin based on clinical suspicion before definitive laboratory test results are available.

Intravenous botulinum antitoxin should be administered as soon as possible, but after collection of serum and other specimens for testing, to all patients with suspected botulism.

- **Foodborne and wound botulism:** Equine trivalent (types A, B, E) and bivalent (types A and B) antitoxin can be made available 24/7/365 by contacting the Epidemiology and Response Division at 505-827-0006 and the CDC Emergency Operation Center at 770-488-7100. Because the antitoxin is of equine origin, testing for hypersensitivity and desensitization may be necessary. For wound botulism, in addition to antitoxin, the wound should be debrided, and appropriate antibiotics administered.

- **Infant botulism:** Infants should be given an investigational human botulinum immunoglobulin available from the California Department of Health Services. To obtain BabyBIG® for a patient with suspected infant botulism, the patient's physician must first contact the Infant Botulism Treatment and Prevention Program (IBTPP) on-call physician at 510-231-7600 to review the indications for such treatment. Inquiring physicians may obtain a checklist that outlines the necessary steps the IBTPP must take to release BabyBIG® to a hospital at www.infantbotulism.org/home.php.

- **Equine botulinum antitoxin** should not be used for infant botulism due to the risk of sensitization and anaphylaxis.
- Antimicrobial therapy is not indicated in infant botulism, as lysis of luminal bacteria could release more toxin.

Patients with suspected or confirmed botulism should have immediate access to intensive care for meticulous supportive care, including intubation and ventilation when indicated.

**Surveillance**

Foodborne:

*Laboratory criteria* - Detection of botulinum toxin in serum, stool, or patient's food or isolation of *Clostridium botulinum* from stool.

**Confirmed** – a clinically compatible case that is laboratory confirmed or that occurs among persons who ate the same food as persons who have laboratory confirmed botulism.

**Probable** - a clinically compatible case with an epidemiologic link (e.g., ingestion of a home canned food within the previous 48 hours.)

Wound:

*Laboratory criteria* - Detection of botulinum toxin in serum or isolation of *Clostridium botulinum* from wound.

**Confirmed** – a clinically compatible case that is laboratory confirmed in a person with no exposure to contaminated food and who has a history of a fresh, contaminated wound or a history of injection drug use during the two weeks prior to symptom onset.

**Probable** - a clinically compatible case in a person with no exposure to contaminated food and who has a history of a fresh, contaminated wound or a history of injection drug use during the two weeks prior to symptom onset.

Infant:

*Laboratory criteria* - Detection of botulinum toxin in serum or stool or isolation of *Clostridium botulinum* from stool.

**Confirmed** – a clinically compatible case that is laboratory confirmed occurring in a child <1-year-old.

**Reporting:**

Report all suspected or confirmed cases of botulism immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. ERD will collect clinical and laboratory information, assist in the shipment of antitoxin for treatment, and arrange for specimen testing at CDC. Information should also be entered into NM-EDSS per established procedures.

**Case Investigation:**

- **Foodborne botulism** – use the Foodborne Surveillance Investigation Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

- **Wound botulism** – use the General Infectious Disease Investigation Form to complete the investigation. Information should be entered into NM-EDSS per established procedures.
• **Infant botulism** – Complete the CDC Infant Botulism Form 52.73 and send to Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico, 87502-6110 or fax to 505-827-0013. Information should be entered into NM-EDSS per established procedures.

### Control Measures

1. **Case management**
   1.1. Isolation: None required.
   1.2. Prophylaxis: Not applicable.

2. **Contact management**
   2.1. Isolation: None required.
   2.2. Prophylaxis: Persons who have eaten the same food implicated in a case of botulism should receive catharsis to remove toxin from the intestine or stomach. They should remain under surveillance for at least one week after exposure. The decision to provide presumptive treatment with antitoxin to an asymptomatic exposed individual, needs to be weighed carefully against the risks for adverse reactions and sensitization to horse serum.

3. **Prevention**
   3.1. Canning of food requires careful attention to adequate control of pH (for food not subject to pressure sterilization), temperature, and time in order to destroy spores.
   3.2. Honey should not be given to children younger than 12 months of age.
   3.3. Immunization: Not applicable.

4. **Outbreak**
   4.1. Report of a single suspected case of botulism requires an immediate response to confirm the index case, facilitate prompt treatment, investigate the source of toxin, and identify additional cases or persons at risk. Infant and wound botulism cases are sporadic. Foodborne and other intestinal botulism cases may occur in protracted outbreaks from commercially distributed food products or from extended use of contaminated foods by restaurants.

### Management of Botulism in Child Care Centers

Refer to recommendations above.

### References

- CDC. Botulism. https://www.cdc.gov/botulism/health-professional.html
What is botulism?
Botulism is caused by a toxin made by a bacterium known as *Clostridium botulinum*. It causes a muscle-paralyzing disease. There are three kinds of botulism:

- **Foodborne botulism** happens when a person consume toxin contain food and becomes ill within a few hours to days.
- **Infant (also called intestinal) botulism** occurs when botulism spores settle in the intestine and then produce toxin. This usually affects infants but may also take place in adults who have certain unusual intestinal conditions.
- **Wound botulism** takes place when a wound has been “dirtied” or contaminated by soil or gravel and the wound is then sealed off from outside air.

What are the symptoms of botulism?

- Symptoms of foodborne botulism include blurred or double vision, dry mouth, and muscle paralysis that may affect breathing. These symptoms appear 12 to 36 hours after eating the food that contains the toxin.
- Symptoms of infant botulism may include constipation, weakness, difficulty breathing, poor feeding, and poor reflexes. It is unknown how long it takes for infant botulism to appear after exposure.
- Symptoms for wound and inhalation botulism are very similar to foodborne botulism. Wound botulism symptoms appear after about seven days. Studies in monkeys have shown that symptoms of inhalation botulism would probably occur 12 to 80 hours after exposure.

How is botulism spread?
A person must eat contaminated food that has not been properly cooked or reheated. With infant botulism, an infant eats food containing bacterial spores and then the bacteria produce the toxin in the gastrointestinal tract. Wound botulism is rare and happens when botulism spores are introduced into a wound by contaminated soil or gravel.

How long are people contagious?
Botulism is not spread from person to person. In other words, people with botulism are not contagious.

Who gets botulism?
Anyone can get botulism.

What treatment is available for people with botulism?
Immediate hospital care is necessary. Persons with botulism may need help with breathing. Antitoxin is available for certain cases of botulism.

Do infected people need to be kept home from school, work or daycare?
People who have botulism will probably be hospitalized. They can return to school or work once they feel well enough.

How can I protect myself and my family from getting botulism?
- Honey and corn syrup should not be fed to infants less than 12 months of age.
- All canned and preserved foods should be properly processed and prepared.
- Do not open bulging containers or eat or taste goods with strange odors.
- Return unopened commercial cans with bulging lids to the place of purchase.
- Home canned vegetables should be boiled, with stirring, for at least three minutes before eating.
- Wound botulism can be prevented by promptly seeking medical care for infected wounds and by not using injectable street drugs.
¿Qué es el botulismo?
El botulismo está causada por una toxina (como un veneno) creada por una bacteria llamada Clostridium botulinum. Es una enfermedad que paraliza los músculos. Hay 3 tipos de botulismo:

- **El botulismo transmitido por alimentos** ocurre cuando una persona ingiere la toxina y se enferma después de unas horas o incluso días.
- **El botulismo infantil** (o intestinal) ocurre cuando las esporas del botulismo se establecen en el intestino y producen la toxina (veneno). Suele afectar a los bebés, pero también puede darse en adultos que tienen ciertas condiciones no usuales del intestino.
- **El botulismo por heridas** ocurre si una herida que está contaminada con tierra o arena se cubre y no le da el aire.

¿Cuáles son los síntomas del botulismo?

- Los síntomas del botulismo transmitido por alimentos incluyen visión doble o borrosa, sequedad de la boca y parálisis muscular que puede afectar a la respiración. Estos síntomas aparecen de 12 a 36 horas después de comer los alimentos que contienen la toxina (veneno).
- Los síntomas del botulismo infantil pueden incluir estreñimiento, debilidad, reflejos lentos y dificultad para respirar y alimentarse. No se sabe cuánto tiempo tarda en aparecer después de estar expuesto.
- Los síntomas del botulismo por heridas y por inhalación son muy similares al transmitido por alimentos. Los síntomas del botulismo por heridas aparecen después de 7 días. Los síntomas del botulismo por inhalación ocurrirían entre 12 y 80 horas después de estar expuesto, según estudios realizados en monos.

¿Cómo se transmite el botulismo?
Se transmite al comer alimentos contaminados que no se cocinaron o recalentaron de forma apropiada. En el caso del botulismo infantil, un bebé puede comer comida que contenga las esporas de la bacteria y ésta produce la toxina (veneno) en su tracto intestinal. El botulismo por heridas es raro y ocurre cuando las esporas del botulismo entran en la herida.

¿Por cuánto tiempo puede alguien con botulismo contagiar a otros?
El botulismo no se transmite de persona a persona. Es decir, las personas con botulismo no son contagiosas.

¿Quién puede contraer el botulismo?
Cualquier persona puede contraer el botulismo.

¿Cómo se trata el botulismo?
Es necesario recibir atención médica en un hospital inmediatamente. Las personas con botulismo pueden necesitar ayuda para respirar. La antitoxina (sustancia contra el veneno) está disponible para determinados casos de botulismo.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Lo más seguro es que las personas con botulismo estén en un hospital. Pueden regresar a la escuela o al trabajo cuando se sientan bien para hacerlo.

¿Cómo puedo protegerme yo y también proteger a mi familia contra el botulismo?

- No se debe dar miel ni jarabe de maíz (se usa en siropes y dulces) a los bebés menores de un año de edad.
- Todas las comidas enlatadas y en conserva deben estar preparadas y procesadas de forma apropiada.
- No abra latas abultadas, tampoco coma o pruebe comida que tenga un olor extraño.
- Regrese a la tienda donde las compró todas las latas sin abrir que tengan tapas abultadas.
- Las verduras que sean de conserva casera deben hervirse, mientras se van removiendo, por lo menos durante tres minutos antes de comerlas.
- El botulismo por heridas puede prevenirse con atención médica inmediata cuando se produce infección en una herida y también si no se usan drogas inyectables.
Campylobacteriosis

Summary

*Campylobacter* infection causes acute gastroenteritis. Most infections are acquired by ingestion of undercooked chicken or pork, drinking unpasteurized milk, handling raw poultry, direct contact with fecal material of infected pets or farm animals, or drinking untreated water. Laboratory diagnosis is confirmed by stool culture. Antimicrobial treatment may shorten the duration of illness and reduce shedding of the organism, although most patients recover without treatment. Symptomatic cases should be excluded from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Disease can be prevented by proper food preparation, thoroughly cleaning surfaces in contact with raw poultry, and by using good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

Agent

Most cases of campylobacteriosis in humans are caused by *Campylobacter jejuni*. Other species that can cause diarrheal illness in humans include *Campylobacter coli*, *Campylobacter fetus*, and *Campylobacter lari*.

Transmission

Reservoir:

*Campylobacter* has been found in wild or domestic animals, primarily in poultry and cattle. Puppies, kittens, swine, sheep, rodents and birds may also harbor *Campylobacter*.

Mode of transmission:

- Infection is acquired through ingestion of *Campylobacter* bacteria in undercooked chicken or pork, contaminated food or water, unpasteurized milk, untreated water, handling raw poultry, or from direct contact with fecal material of infected pets, farm animals, or infected persons (although person to person transmission of *C. jejuni* is uncommon). Chronic infection of poultry and other animals represents the primary source of infection.

Period of communicability:

- In humans, the period of communicability is throughout the course of infection and can range from several days to several weeks. Individuals not treated with antibiotics may excrete the organism for as long as 2-7 weeks.

Clinical Disease

Incubation period:

- Usually 2-5 days, with a range of 1 to 10 days.

Illness:

The gastrointestinal illness is characterized by an acute onset of diarrhea, abdominal pain and cramping, nausea, vomiting, and fever. The abdominal pain can mimic appendicitis. Most patients recover in less than one week, even in the absence of antibiotic treatment. However, 20% may have prolonged illness or a relapse. Stool often demonstrates gross or occult blood and the presence of white blood cells. Other less common syndromes associated with
Campylobacter infection include Guillain-Barré syndrome, reactive arthritis, or Reiter’s syndrome (a form of arthritis that affects the eyes, urethra, skin, and joints).

**Laboratory Diagnosis**

The diagnosis of *Campylobacter* gastroenteritis is established via a stool culture. Stool samples should be submitted in enteric pathogen transport media.

Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnosis. Because this method is highly sensitive, a patient may test positive for multiple organisms, including *Campylobacter spp.* investigations and reflex culture are required to confirm a diagnosis.

**Treatment**

Most patients with *Campylobacter* gastroenteritis will recover without treatment. However, antimicrobial therapy given early in the infection can eradicate the organism from the stool within 2 to 3 days, shorten the duration of illness, and prevent relapse. Antibiotics should be used in patients with high fever, grossly bloody stools, prolonged illness (>1 week), or immunocompromised status. Common antibiotics used include erythromycin, azithromycin, or a fluoroquinolone; the recommended duration of treatment is 3-5 days. Resistance to fluoroquinolones is common, antimicrobial susceptibility testing can help guide appropriate therapy. Treatment decisions should be made in conjunction with the patient’s health care provider.

**Surveillance**

Case Definition:

- *Laboratory criteria* – Isolation of *Campylobacter* from a clinical specimen.
- *Confirmed* – A case that is laboratory confirmed.
- *Probable* – A case that is positive by CIDT methods without culture confirmation or a clinically compatible case that is epidemiologically linked to a confirmed case.

Reporting:

Report all suspected, probable, or confirmed cases of *Campylobacter* to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the Foodborne Surveillance Investigation Form to complete your Investigation. Information should also be entered into NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio> STEC> Cryptosporidium> Salmonella> Shigella> Campylobacter> Cyclospora> Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. Case management
1.1. Isolation:

1.1.a Exclude symptomatic persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Antimicrobial treatment should be considered for these persons. These persons may be allowed to resume their usual duties when:

- Diarrhea has resolved, and
- Proper hygiene measures can be maintained (as assessed by a food sanitarian, trained environmentalist, or infection preventionist).

1.1.b Exclusion of asymptomatic infected persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients may be indicated if their food handling or personal hygiene habits (as assessed by a food sanitarian, trained environmentalist, or infection preventionist) are inadequate to prevent transmission of enteric infection to patrons or patients. They need not be excluded from work if proper hygiene measures are maintained.

1.1.c For hospitalized patients, contact precautions should be used.

1.2. Prophylaxis: Not applicable.

2. Contact management

2.1. Isolation: None required.

2.2. Prophylaxis: Not applicable.

3. Prevention

3.1. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food, especially raw poultry). Thoroughly clean cutting boards and surfaces that have been in contact with raw poultry.

3.2. General guidelines for preventing foodborne illness include:

- Thoroughly cook raw food from animal sources.
- Wash raw vegetables.
- Avoid unpasteurized dairy products.
- Avoid drinking untreated water.
- Wash hands, knives, and cutting boards after handling uncooked foods.

3.3. Immunization: Not applicable.

Management of *Campylobacter* in Child Care Centers

1. Outbreaks of *Campylobacter* infection in child care centers are uncommon.

2. Management of isolated cases

2.1. When a case of *Campylobacter* occurs among a child care center attendee, that child should be excluded until s/he is asymptomatic, and the stools are formed. Asymptomatic children may return to child care without follow-up stool cultures.
2.2. Per child care licensing regulations, a center should notify parents or guardians in writing of a case of *Campylobacter* in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 7 for a template of a notification letter.

2.3. When a case of *Campylobacter* occurs among a child care center staff member, that person should be excluded from their work duties until they are asymptomatic as defined above.

2.4. A case of *Campylobacter* in a child care facility should prompt the search for other cases among children and staff members of the facility, as well as household members or other close contacts of the index case. Stool cultures should be obtained on other symptomatic persons.

2.5. The child care center should review its infection control protocols with staff, and emphasize the following:

- Standard precautions should be followed. Strict hand washing routines for staff and children, and routines for handling fecally contaminated materials, should be assured.

- Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, and then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).

- Food-handling and diaper changing areas should be physically separated and cleaned daily.

- Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.

- Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

- Animals with diarrhea in a child care center should be isolated from children and taken to a veterinarian for diagnosis and treatment.

References


What is campylobacter?
When your doctor says that you have campylobacteriosis, the doctor means that you have an intestinal or stomach infection with bacteria called Campylobacter.

What are the symptoms of campylobacter infection?
Campylobacteriosis causes mild or severe diarrhea, often with traces of blood in the stool (feces). Sometimes persons develop fever. Symptoms usually appear 2 to 5 days after the exposure.

How is campylobacter spread?
Campylobacter is usually spread by eating or drinking contaminated or “dirtied” food or water and, sometimes by contact with infected animals. Animals such as pigs, cattle, dogs, cats, and birds (particularly poultry such as chicken and turkey) may carry the bacteria in their intestines. These sources may contaminate meat products (especially poultry), water supplies, milk, and other foods.

How long are people contagious?
Generally, infected people will continue to pass the bacteria in their stool for a few days to a week or more. Certain antibiotics may shorten this phase.

Who gets campylobacter?
Anyone can get campylobacter infection.

What treatment is available for people with campylobacter?
Most campylobacter infections will go away without treatment. However, there are some instances where your health care provider may recommend treatment with antibiotics to make you feel better sooner and shorten the time Campylobacter are present in your stool. Persons with diarrhea should drink plenty of fluids.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria are passed in stool, people with diarrhea should be excluded from day care, patient care, and food handling. Most infected people may return to work or school when their diarrhea stops, provided that they carefully wash their hands after using the toilet and before preparing food.

How can I protect myself and my family from getting campylobacter?
You can decrease your chance of coming in contact with Campylobacter with the following practices:

- Always treat raw poultry, beef and pork as if they are contaminated.
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Avoid food or water from sources that may be contaminated.
- Wrap fresh meats in plastic bags at the market to prevent blood from dripping on other foods.
- Refrigerate foods promptly; do not hold foods at room temperature for greater than two hours.
- Immediately wash cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached, particularly when using a microwave for cooking.
¿Qué es la campilobacteriosis?
Si su doctor le dice que tiene "campilobacteriosis", lo que quiere decir es que usted tiene una infección en su estómago o intestinos causada por bacterias del tipo Campylobacter.

¿Cuáles son los síntomas de una infección por Campylobacter?
La campilobacteriosis causa diarrea leve o grave, a menudo con presencia de sangre en las heces. A veces se puede desarrollar fiebre. Los síntomas normalmente aparecen entre 2 y 5 días después de haber estado expuesto.

¿Cómo se transmite la campilobacteriosis?
Se suele transmitir al tomar agua o comer alimentos contaminados y, a veces, puede transmitirse por contacto con animales infectados. Esto ocurre porque los animales como los puercos, las vacas, los perros, los gatos y las aves (en particular pollos y pavos) pueden tener la bacteria en sus intestinos y contaminar la carne que comemos (sobre todo el pollo), el agua, la leche y otros alimentos.

¿Por cuánto tiempo puede alguien con campilobacteriosis contagiar a otros?
Generalmente, el germen se encontrará presente en las heces de las personas infectadas por unos días, o hasta una semana o más. Algunos antibióticos pueden reducir el tiempo que dura esta fase.

¿Quién puede contraer campilobacteriosis?
Cualquier persona puede contraer una infección por Campylobacter.

¿Cómo se trata la campilobacteriosis?
La mayoría de las infecciones por Campylobacter desaparecen sin usar ningún tratamiento. Sin embargo, hay algunos casos en los que su médico le puede recomendar tratamiento con antibióticos para hacerle sentir mejor y reducir el tiempo durante el cual el Campylobacter está presente en sus heces. Las personas que tienen diarrea deben tomar muchos líquidos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
La bacteria está presente en las heces, por eso las personas con diarrea no deben ir a la guardería y si trabajan con pacientes o manipulando alimentos, deben quedarse en casa. La mayor parte de las personas infectadas pueden regresar a la escuela o al trabajo cuando ya no tengan diarrea, pero se tienen que lavar las manos con cuidado después de ir al baño y antes de preparar cualquier comida.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la campilobacteriosis?
Para reducir sus posibilidades de entrar en contacto con la bacteria que causa la campilobacteriosis, haga lo siguiente:

- Siempre trate la carne de pollo, res y puerco con precaución, como si estuviera contaminada.
- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Evite agua o comida que puedan provenir de fuentes contaminadas.
- Ponga la carne cruda dentro de bolsas de plástico cuando la compre en el mercado para que la sangre de ésta no se mezcle con otros alimentos.
- Ponga los alimentos en el refrigerador rápido, deben estar a temperatura ambiente el mínimo tiempo posible.
- Lave inmediatamente los tableros para cortar y mostradores que usó para preparar estos alimentos, de esta forma evita que otros alimentos se puedan contaminar también.
- Asegúrese de que la carne se cocina con la temperatura interna correcta, sobre todo si usa un horno microondas para cocinarla.
Carbapenam-Resistant Enterobacteriaceae

Summary

Carbapenem-resistant Enterobacteriaceae (CRE) include organisms under the Enterobacteriaceae family that are resistant to carbapenems. Antibiotics within the carbapenem class include imipenem, meropenem, ertapenem and doripenem. Enterobacteriaceae commonly found to exhibit significant clinical resistance to carbapenems include *E. coli*, *Klebsiella* and *Enterobacter* species. These bacteria are found in normal human intestines (gut). Sometimes these bacteria can spread outside the gut and cause serious infections, such as urinary tract infections, bloodstream infections, wound infections, and pneumonia. Enterobacteriaceae can cause infections in people in both healthcare and community settings.

CRE are frequently resistant to multiple antibiotic groups, making treatment of CRE infections challenging. Carbapenem resistance may be chromosomal in nature or, acquired through plasmids. Different mechanisms of resistance exist; of these the production of carbapenemases, typically acquired via plasmids, is of great concern due its proclivity to spread, hence the focus on infection prevention. Early detection and aggressive implementation of infection control and prevention strategies are necessary to prevent further spread of CRE.

Agent

The Enterobacteriaceae are a large family of over 70 genera of gram-negative bacilli that include *Escherichia coli*, *Klebsiella* species, and *Enterobacter* species (see table below). These organisms are normally found in the gastrointestinal tract of humans and other animals and can cause infections that range from mild to severe. These organisms are a common cause of community-acquired and healthcare–associated infections. Antibiotic resistance has become more widespread among this class of bacteria over the past several decades, and of particular concern is the increase of resistance to a class of antibiotics known as carbapenems, a powerful last resort antibiotic.

<table>
<thead>
<tr>
<th>Averyella</th>
<th>Hafnia</th>
<th>Pragia</th>
<th>Yersinia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budvicia</td>
<td>Klebsiella</td>
<td>Proteus</td>
<td>Yokenella</td>
</tr>
<tr>
<td>Buttiauxella</td>
<td>Kluyvera</td>
<td>Providencia</td>
<td></td>
</tr>
<tr>
<td>Cedecea</td>
<td>Leclercia</td>
<td>Rahnelia</td>
<td>Enteric Group 58</td>
</tr>
<tr>
<td>Citrobacter</td>
<td>Leminorella</td>
<td>Salmonella</td>
<td>Enteric Group 60</td>
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<tr>
<td>Cronobacter</td>
<td>Moellerella</td>
<td>Serratia</td>
<td>Enteric Group 63</td>
</tr>
<tr>
<td>Edwardsiella</td>
<td>Morganella</td>
<td>Shigella</td>
<td>Enteric Group 64</td>
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<tr>
<td>Enterobacter</td>
<td>Pantoea</td>
<td>Tatumella</td>
<td>Enteric Group 68</td>
</tr>
<tr>
<td>Escherichia</td>
<td>Photorhabdus</td>
<td>Trabulsella</td>
<td>Enteric Group 69</td>
</tr>
<tr>
<td>Ewingella</td>
<td>Plesiomonas</td>
<td>Xenorhabdus</td>
<td>Enteric Group 137</td>
</tr>
</tbody>
</table>

Transmission

Reservoir:

CRE is found in the gastrointestinal tract of humans and animals. Colonized patients and the healthcare environment can also serve as significant reservoirs of CRE bacteria.

Mode of Transmission:
• Person to person through contact with infected or colonized people, particularly through secretions, wounds or stool
• Contact with contaminated equipment
• Through the hands of healthcare personnel
• Self-inoculation of gut bacteria

Period of communicability:
• Once infected or colonized, colonization is considered indefinite and patient should be placed on contact precautions at time of admission.

**Clinical Disease**

**Illness:**

CRE can cause pneumonia, bloodstream infections, urinary tract infections, intra-abdominal infections, and surgical site infections, among others. Patients can be colonized with CRE (positive clinical culture without symptoms of infection); however, they can serve as vectors to other patients or sources for health care facility outbreaks. Patients most at risk for CRE infection are those with chronic medical conditions, frequent or prolonged stays in health care settings, invasive medical devices (e.g., ventilators or intravenous catheters), or a history of taking certain antibiotics for long periods of time.

**Laboratory Diagnosis**

A confirmed case of CRE is a patient whose clinical or surveillance specimen culture yields a bacterium of the *Enterobacteriaceae family* that test resistant to any carbapenem including doripenem, ertapenem, imipenem, or meropenem using the current M100-S26 CLSI breakpoints. All confirmed isolates should be forwarded to the State Public Health Laboratory (SLD) for further characterization.

<table>
<thead>
<tr>
<th>Current MIC Breakpoints (μg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIC Interpretation</strong></td>
</tr>
<tr>
<td><strong>Carbapenems</strong></td>
</tr>
<tr>
<td>Doripenem</td>
</tr>
<tr>
<td>Ertapenem</td>
</tr>
<tr>
<td>Imipenem</td>
</tr>
<tr>
<td>Meropenem</td>
</tr>
</tbody>
</table>

1MIC = minimum inhibitory concentration 2CLSI. *Performance Standards for Antimicrobial Susceptibility Testing Twenty-Sixth Informational Supplement* 3CLSI document M100-S26, Wayne, PA: Clinical and Laboratory Standards Institute: Jan 2016.

OR
Positive for a carbapenemase by a nucleic acid amplification test; (e.g., PCR-positive for KPC, NDM, IMP, VIM, or OXA-48)

OR

Are positive for carbapenemase production by a phenotypic test.

Note: *Proteus* spp., *Providencia* spp. and *Morganella* spp. are excluded from this definition if only imipenem resistance is detected because these species have intrinsic resistance to imipenem. For example, isolates that test ertapenem susceptible but imipenem resistant would not meet the definition.

**Treatment**

Treatment is case specific and based on clinical signs and symptoms as well as pertinent laboratory or radiologic findings. Containment is the priority for public health.

**Surveillance**

Case Definition:

**Confirmed:** meets laboratory criteria (below)

**Probable:** not applicable

**Suspect:** not applicable

When to Report:

- Laboratory isolation of any Enterobacteriaceae genera with resistance to imipenem, meropenem, doripenem, or ertapenem from any site.
- Whenever an Enterobacteriaceae genera organism is tested for resistance mechanism.
- Any diagnosis of Carbapenem-resistant Enterobacteriaceae (CRE) or Carbapenamase producing CRE (CP-CRE) infection or colonization.

What to Report:

- The Enterobacteriaceae genera that is resistant to Carbapenamase.
- The results of all susceptibility testing done on the specimen, including MIC and interpretations
- All results (positive and negative) resistance mechanism tests (Modified Hodge Test, CarbaNP, KPC, NDM, VIM, IMP, OXA-48, etc).

**Reporting**

Report all infections, including non-healthcare-associated, within 24 hours to Epidemiology and Response Division (ERD) by fax at 505-827-0013 or by phone at 505-827-0006. Information needed includes: patient's name, age, date of birth, sex, race, ethnicity, home address, home phone number, occupation, specimen collection date, and health care provider.

**Case Investigation**
Use the CRE checklist to begin an investigation. Information should also be entered into NMEDSS per established procedures. Clinical laboratory should be contacted to ensure submission of isolates to SLD. Case should then be referred to Healthcare-associated Infections (HAI) epidemiologist for further management.

SUBMISSION
Please send isolates to SLD
1101 Camino de Salud NE Albuquerque, NM 87102

Collection: Send isolate on culture medium such as nutrient agar slants or MAC agar plates.

Special Requirements: Carbapenemase producing Enterobacteriaceae plasmids are not stable. Keep isolate refrigerated until shipment. Avoid multiple subcultures.

Handling: Refrigerate immediately upon growth of isolate.

Include: Copy of susceptibility report and Clinical Test Request form.

Analysis Requested: Under Bacteriology, please check “Other:” and write in “CRE” and organism genus and species.

Shipping: Send cold, on an ice pack. Do not freeze. Pack as a Category B Specimen in accordance with all Department of Transportation (DOT) and International Air Transport Association (IATA) guidelines. Send to the Scientific Laboratory Division (SLD).

Contact: GM Supervisor (505-383-9128), or GM Line Supervisor (505-383-9127).

Control Measures
Hand washing is the most important measure for preventing transmission of CRE. Wash hands before preparing or eating food, before and after changing wound dressings, after coughing or sneezing, after blowing your nose, and after using the bathroom. Use household hand soap and warm water and rub hands for at least 20 seconds before rinsing.
If an individual requires continued care at home, caregivers should wear gloves when handling body fluids (urine, wound drainage, etc.), when providing care, or when in contact with surfaces contaminated with body fluids. They should wash hands immediately after removing gloves.

Disposable items soiled by body fluids (dressings, diapers, used gloves, etc.) should be placed in the trash immediately. Good cleaning with soap and water followed by a household disinfectant such as bleach is adequate to disinfect surfaces contaminated with CRE. Launder used clothing, sheets and linens using standard laundry detergent and make sure items are completely dry before using. Used dishes and utensils can be handled and washed as usual.

**See Appendix A for Facility Control Measures**

Please refer to CDCs toolkit at: [https://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf](https://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf) for additional facility recommendations.

**Management of CRE in Child Care Centers**

Refer to recommendations above.

**References**


Infection Prevention Action Needed

If patient is infected or has been colonized with either a carbapenem-resistant Enterobacteriaceae (CRE), carbapenemase-producing CRE (CP-CRE), or a carbapenemase-producing Pseudomonas aeruginosa (CP-PA).

Depending on the bacteria, the following actions items need to be implemented immediately.

### Acute Care Hospitals

<table>
<thead>
<tr>
<th>Patient Recommendations</th>
<th>Infection Prevention Measures</th>
<th>CRE</th>
<th>CP-CRE/CP-PA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Infected</td>
<td>Colonized</td>
</tr>
<tr>
<td>Standard Precautions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Contact Precautions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Designated or Disposable Equipment</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Private Rooms</td>
<td>Yes, if available&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes, if available&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes</td>
</tr>
<tr>
<td>Door Signage</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Chlorhexidine (CHG) Bathing</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Visitor Recommendations

| Frequently perform hand hygiene, emphasizing after leaving resident’s room | Yes | Yes | Yes | Yes |
| Wear gown/gloves if contact with body fluids is anticipated | Yes | Yes | Yes | Yes |
| Wear gown/gloves if no contact with body fluids is anticipated | No | No | No | No |

### Long Term Care Facilities

<table>
<thead>
<tr>
<th>Patient Recommendations</th>
<th>Infection Prevention Measures</th>
<th>CRE</th>
<th>CP-CRE/CP-PA</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Infected</td>
<td>Colonized</td>
</tr>
<tr>
<td>Standard Precautions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Contact Precautions</td>
<td>Yes</td>
<td>No, unless at higher risk&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Yes</td>
</tr>
<tr>
<td>Designated or Disposable Equipment</td>
<td>Yes</td>
<td>No, unless at higher risk&lt;sup&gt;2&lt;/sup&gt;</td>
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</tr>
<tr>
<td>Private Rooms</td>
<td>Yes, if available&lt;sup&gt;1&lt;/sup&gt;</td>
<td>No, unless at higher risk&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Yes</td>
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<tr>
<td></td>
<td>Yes</td>
<td>No, unless at higher risk&lt;sup&gt;2&lt;/sup&gt;</td>
<td>No, unless at higher risk&lt;sup&gt;2&lt;/sup&gt;</td>
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<tr>
<td>Restricted to room</td>
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<tr>
<td>Door Signage</td>
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<td></td>
</tr>
<tr>
<td>Chlorhexidine (CHG) Bathing</td>
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<td></td>
</tr>
<tr>
<td>Enhanced Environmental Cleaning&lt;sup&gt;3&lt;/sup&gt;</td>
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<td>No</td>
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</tbody>
</table>

**Visitor Recommendations**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Frequently perform hand hygiene, emphasizing after leaving resident’s room</td>
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</tr>
<tr>
<td>Wear gown/gloves if <strong>contact</strong> with body fluids is anticipated</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wear gown/gloves if <strong>no contact</strong> with body fluids is anticipated</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

1. Private room is highly recommended but is left to the discretion of the infectious disease consult and/or the infection preventionist. Please refer to the microbiology laboratory results for susceptibility pattern.

2. Contact precautions should be maintained and, if feasible, provided a private room for residents who are at higher risk for transmission (i.e. ventilator-dependent patients, wounds with difficult to control drainage, incontinence of urine or stool, or those who engage in behavior that spreads infection).

3. Ensure that environmental cleaning procedures adhere to Hospital Infection Control Practices Advisory Committee (HICPAC) recommendations. (CDC. The Guidelines for Environmental Infection Control in Health-Care Facilities. MMWR 2003/52(RR10);1-42)
**What are Carbapenem-resistant Enterobacteriaceae?** Carbapenem-resistant Enterobacteriaceae (CRE) are a family of bacteria that are highly resistant to a type of antibiotic called carbapenems. These antibiotics are often considered the last line (meaning strongest) of antibiotics. Resistance to these antibiotics makes infections caused by these bacteria extremely difficult to treat.

**What Kind of Infections are Associated with CRE?** Infections that are associated with CRE include:
- Pneumonia
- Urinary tract infections (UTIs)
- Wound infection
- Blood infection (Sepsis)
- Abdominal infections

**How is CRE Spread?** CRE is typically spread from touching an infected person’s bodily fluids (blood, drainage from a wound, urine, stool, or sputum) or from touching a contaminated surface (such as a countertop, chair, doorknob, phone). In a healthcare setting, the bacteria can spread from the hands of healthcare personnel, through contact with contaminated surfaces or improperly cleaned patient care equipment. CRE is not spread through the air or casual contact such as hugging.

**Who is at Risk?** Healthy people usually do not get CRE infection. Infection often occurs in patients in hospitals, nursing homes, and other healthcare settings, those who have a weakened immune system, and/or who are taking long courses of certain antibiotics are most at risk for CRE infections. Patients who are on medical devices, such as ventilators (breathing machines), urinary (bladder) catheters, or intravenous (IV) catheters are also at a higher risk.

**What is the difference between being Colonized and being Infected with CRE?** A person can either be colonized or infected with CRE. If a person is colonized, it means that the bacteria can be found in the gut, but the person does not feel sick and is not displaying any signs or symptoms of an illness. A colonized person does not need antibiotics for their CRE. A person who is colonized can transmit the bacteria to others if good hand washing is not followed. If a person is infected, it means that the person is experiencing signs and symptoms of an illness.

**Do infected people need to be kept home from school, work or daycare?** No.

**How long are people contagious?** Individual factors determine the risk at which any person may be to acquire an infection with this organism. Serious infections are seen among individuals with underlying diseases. Duration of colonization rates are not known.

**What treatment is available for people with CRE?** A variety of combinations may be tried in a clinical setting depending on the characteristics of the organism. A clinician with experience and training in Infectious Diseases should be consulted in these instances.

**How can I protect myself and my family?** CRE primarily affects people with an underlying medical problem(s) and/or patient who have a weakened immune system. Generally, healthy people are at low risk of developing an infection, but they may become carriers. To prevent the spread of CRE, you and your loved ones should wash your hands often, especially:
- Before preparing or eating food.
- Before and after changing wound dressings.
- After using the restroom.
- Before or after handling any medical devices.
- After touching hospital surfaces such as bed rails, bedside tables, doorknobs, remote control or phone.

Take antibiotics only when prescribed and according to the prescriber recommendation.
¿Qué son las enterobacteriaceae resistentes al carbapenam? Las enterobacteriaceae resistentes al carbapenam (ERC) son una familia de bacterias altamente resistentes a un tipo de antibióticos llamado carbapenams. Estos antibióticos suele ser considerados como la última línea de antibióticos (es decir, la más fuerte). La resistencia a estos antibióticos hace que el tratamiento de infecciones causadas por estas bacterias sea muy difícil.

¿Cuáles son los síntomas de las ERC? Las infecciones asociadas con ERC incluyen:
- Neumonía
- Infecciones del tracto urinario (ITU)
- Infecciones en heridas
- Infecciones en la sangre (Sepsis)
- Infecciones abdominales

¿Cómo se transmite la ERC? La ERC normalmente se transmite al tocar los fluidos corporales de una persona infectada (sangre, drenaje de una herida, orina, heces, o saliva), o al tocar una superficie contaminada (tal como mostradores, sillas, manijas, teléfonos). En una clínica u hospital, la bacteria se puede transmitir por las manos del personal de salud, a través del contacto con superficie contaminadas o por equipos del cuidado del paciente que no se hayan limpiado correctamente.

¿Quién puede contraer la ERC? Las personas saludables no suelen infectarse con ERC. Estas infecciones suelen ocurrir en personas que están hospitalizadas, residentes de ancianatos o de otros centros de cuidado, en aquellos con el sistema inmune debilitado, y/o aquellos que están tomando antibióticos por periodos prolongados. Los pacientes que requieren del uso de instrumentos médicos tales como ventiladores (máquinas para respirar), catéteres urinarios (vejiga), o catéteres intravenosos, también están en mayor riesgo de infección.

¿Cuál es la diferencia entre estar Colonizado o estar Infectado por las ERC? Una persona puede estar infectada o colonizada a la vez con ERC. Si una persona esta colonizada significa que la bacteria se puede encontrar en el intestino, pero la persona no siente síntomas y no se siente enfermo. Una persona colonizada no necesita antibióticos para su ERC. Una persona colonizada puede transmitir la bacteria a otros si no sigue buenas técnicas de higiene. Si una persona está infectada significa que es persona exhibe síntomas y señales correspondientes a la enfermedad.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo? No.

¿Por cuánto tiempo puede alguien con ERC contagiar a otros? Hay factores individuales que determinan el nivel de riesgo que tiene una persona de contagiarse con este organismo. Las infecciones severas se observan en individuos con condiciones crónicas. Aun no se sabe cuánto tiempo puede una persona permanecer colonizada.

¿Cómo se trata la ERC? En las clínicas u hospitales se pueden intentar varias combinaciones dependiendo de las características del organismo. Un médico con experiencia y entrenamiento en Enfermedades Infecciosas debe ser consultado en estos casos.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la ERC? La ERC afecta principalmente a las personas con problemas médicos y/o a los pacientes con el sistema inmune debilitado. Generalmente, las personas sanas tienen muy bajo riesgo de infectarse, pero podrían convertirse en portadores.

Para prevenir la transmisión de la ERC, usted y sus seres queridos deben lavarse las manos muy seguido, especialmente:
- Antes de preparar o ingerir alimentos.
- Antes y después de cambiar pañales.
- Antes y después de limpiar las vendas de una herida.
- Después de usar el baño.
- Antes y después de manipular instrumentos médicos.
- Después de tocar superficies en los hospitales, tales como, bordes de la cama, mesas de noche, manijas, control remoto, o teléfono.

Tome antibióticos solo cuando se los haya recetado un médico y de acuerdo a las especificaciones dadas.
Child Care Settings – Selected Infectious Diseases

Summary

Child care settings include home care by relatives, short-stay cooperatives, mothers’ day-out programs, family day homes, and large child care centers.

Infectious diseases occur with increased frequency in child care facilities. There are several factors that affect the risk of disease in these facilities, including age of child, immunity of the group, number of children, the degree of close contact between children and providers, and the hygienic habits of the children and care providers. This document provides information about infectious diseases not individually notifiable by the New Mexico Administrative Code, but which may commonly be seen in child care facilities. The table at the end of this chapter contains a list of diseases and exclusion criteria. Please call the Epidemiology and Response Division (ERD) regarding suspected outbreaks at 505-827-0006.

The types of infectious diseases commonly seen in child care settings include diseases of the skin and scalp, rash illnesses, and respiratory illnesses.

Contact Precautions – General Recommendations

When in direct contact with a body area that is known or suspected to be infectious, barrier protection should always be used. This includes glove use and prompt hand washing before and after putting on the gloves. Depending on how extensive the direct contact with the infected area is, gowns may also be used. Contact with items used by the infected person may also transmit infection. Gloves should be used when exposed to contaminated inanimate objects. Since the hands are the most common method of transmission of these diseases, hand washing after the removal of gloves is required.

The child care center also should review its infection control protocols with staff, and emphasize the following:

- Standard precautions should be followed including strict hand washing routines for staff and children and routines for handling fecally contaminated materials.
- Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, and then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).
- Food handling and diaper changing areas should be physically separated and cleaned daily.
- Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute one cup bleach in nine cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, non porous gloves should be worn when changing diapers.
- Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize
testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

- Animals are not recommended for child care centers. However, if an animal is present and has diarrhea, the animal should be isolated from children and taken to a veterinarian for diagnosis and treatment.
Skin and Scalp Illnesses

- Head Lice
- Herpes Simplex
- Impetigo
- Ringworm
- Scabies

Head Lice – *Pediculus capitis*

**Agent**

*Pediculus humanus capitis* is the human head louse. Adult lice and nymphs (immature lice), feed on human blood. Adult lice deposit their eggs (nits) on hair shafts. Lice from nymph to adult stage, as well as the eggs, are visible on inspection. Adult lice are up to 3mm in length. Outbreaks of head lice are common among children in schools and daycare, affecting all socioeconomic groups. Because there is no evidence that head lice transmit disease, pediculosis is considered a nuisance rather than a health hazard.

**Transmission**

Reservoir:

Humans.

Mode of Transmission:

Direct contact with an infected person and (uncommonly) objects used by them. Lice are spread by close head to head contact with someone who has head lice. Head lice do not fly or jump; they crawl from place to place.

Period of Communicability:

As long as lice or eggs remain alive on the infected person or on fomites. The adult’s life span is approximately one month. Head lice can survive only 1 to 2 days away from the scalp.

**Clinical Disease**

Incubation Period:

The life cycle is composed of three stages: eggs, nymphs and adult. The incubation period from laying of the eggs to hatching of the first nymph is 6 to 9 days. Mature adult lice capable of reproducing do not appear until 2 to 3 weeks later.

Illness:

Infestation of head lice occurs in head hair. Itching is the most common symptom of head lice, but not always present, particularly when newly arrived to the head. Excoriation and crusting caused by secondary bacterial infection may occur.

**Diagnosis Note** - Misdiagnosis of head lice infestation is common.

Proper diagnosis of head lice is the most important step in controlling infestation. Identification of eggs and lice can be done by the naked eye, although adult lice are seldom seen because they move rapidly in dry hair and conceal themselves. Inspect for live lice especially at the hairline, including behind the ears, and the nape of the neck. Most persons with head louse infestation will have between 10 and 20 lice. Lice live near the scalp to feed and to maintain their body temperature. Nits (eggs) are grayish-white round balls that are attached to the hair shaft.

**Treatment**
Two methods of treatment are commonly used:

1. **Chemical treatment** to kill the lice and nymphs: Chemical treatment has been the first line of defense for many years; consequently, lice have become resistant to insecticides. Pediculocide resistance is approaching 50%. Educate the parent on the proper regime by following the manufacturer’s recommendations. Re-treatment at 9-10 days following initial treatment is often recommended with these products especially if signs of the lice are still present. All household members should be checked for live lice and everyone with lice in the household should be treated at the same time.

2. **Non-chemical treatment**: Involves applying hair conditioner to wet washed hair, then combing with a louse comb (special fine toothed comb). The caregiver sections off the hair and removes the lice a section at a time combing from the scalp out. Rinse and dry the hair once the entire head has been combed. Repeat this process every two days over a 10 day period. Recheck the head for re-infestation once a week for one month. If adult lice are found, then restart the combing process with the fine-toothed comb. Check all household members for live lice and nits and treat using this same regime.

Discuss the importance of appropriate treatment of hair. The use of alternative treatments such as olive oil, mayonnaise, margarine, or petroleum jelly has not been evaluated scientifically.

**Control Measures**

Facility wide head checks are no longer recommended.

For the home, inspect all other people for live lice.

Bedmates of infested people should be treated prophylactically at the same time as the infested household members and contacts. Prophylactic treatment of other noninfested people is not recommended.

**Children should not be excluded or sent home early from school because of head lice.** The “no-nit” policies requiring that children be nit free before returning to school have not been effective in controlling head lice transmission and are not recommended.

Supplemental measures generally are not required to eliminate an infestation. Head lice are only rarely transferred via fomites from shared headgear, clothing, combs, or bedding. Special handling of such items is not likely to be useful. Educating people on transmission, treatment, and management is the best method for controlling head lice.
Herpes Simplex

Agent

Herpes simplex virus (HSV) is in the virus family Herpesviridae. Herpes simplex type 1 (HSV-1) is the most common cause of oral and non-genital herpes. Herpes simplex type 2 (HSV-2) is the primary cause of genital herpes. However, either type of virus can be found in either body area. HSV-1 oral lesions (or herpes labialis) will be covered in this section.

Transmission

Reservoir:
- Humans.

Mode of Transmission:
- Direct contact with HSV shed from oral lesions or secretions or from other skin sites, either from symptomatic persons or those shedding the virus asymptomatically.

Period of Communicability:
- HSV can be isolated for at least one week and up to 7 weeks after the primary lesion. An infected person may be asymptomatic and still shed and transmit virus, although patients with recurrent infection shed virus for a much shorter period, typically 3 to 4 days.

Clinical Disease

Incubation Period:
- Ranges from 2-14 days.

Illness:
- Primary infection with HSV1 may be mild and unapparent and occur in early childhood. Gingivostomatitis is the most common clinical manifestation of primary HSV1 infection. Illness is characterized by fever, cervical adenopathy, and ulcers on the mucous membranes of the mouth. After primary infection, HSV persists in neural ganglia for life. The common reactivation of latent infection results in fever blisters or cold sores (herpes labialis) manifesting as superficial clear vesicles on an erythematous base, usually on the face or lips, which crust and heal within a few days. Various forms of trauma, fever, physiologic changes, or intercurrent disease precipitate reactivation.

Laboratory Diagnosis

- Viral culture of fluid from lesions or cold sores, or from the mouth, can be performed though diagnostic testing of oral lesions is not common. Some laboratories offer direct fluorescent staining from scrapings of the base of a lesion.
- Polymerase chain reaction (PCR) testing may be available.
- Serologic tests are not helpful for diagnosing acute HSV infections.

Treatment

Episodes of herpes labialis are self-limited and generally do not require treatment. Recurrent episodes or complicated infections should be referred to the child’s healthcare provider for medical management.

Control Measures
• Contact isolation with use of barrier protection (gloves) and proper hand hygiene when in contact with potentially infectious lesions. A bandage over the sore, if possible, will reduce contagiousness. Avoid kissing or sharing cups or bottles with an infected child. Equipment, toys, and dishes used by the child should be cleaned with a disinfectant.

• Exclusion – Children with primary HSV gingivostomatitis who do not have control of oral secretions should be excluded from child care until signs and symptoms resolve. There is no exclusion from child care or school for children with simple cold sores (i.e., recurrent HSV).
Impetigo

Agent
The primary pathogens causing impetigo are *Staphylococcus aureus* and *Streptococcus pyogenes* (group A *Streptococcus* [GAS]).

Transmission
Reservoir:
The only significant reservoir is humans.
Mode of Transmission:
Direct contact with a person with a purulent lesion or who is an asymptomatic carrier of a pathogenic strain. The carrier will be colonized in the nose and throat and transmit the organism by respiratory droplets, or by autoinfection. Hands are the most important mechanism for transmitting infection. Colonization of healthy skin by GAS usually precedes the development of skin infection. Impetigenous lesions occur at the site of breaks in skin such as insect bites or other wounds.
Period of Communicability:
Generally, as long as purulent lesions continue to drain or the carrier state persists.

Clinical Disease
Incubation period:
Streptococcal infections: 7 to 10 days. Staphylococcal infections: 4 to 10 days.
Illness:
Flat, red, yellow, crusty or weeping lesions seen commonly on the face and arms. The lesions are usually superficial that proceed through vesicular, pustular and encrusted stages. Bullae may form. Constitutional symptoms are usually absent, although streptococcal skin infections can have serious sequelae such as acute glomerulonephritis.

Laboratory Diagnosis
Routine culturing of impetiginous lesions is not usually indicated.

Treatment
- In localized skin infections, cleaning the area and applying appropriate topical antimicrobial ointment.
- Systemic antimicrobial therapy is usually not indicated unless an infection spreads significantly or there is impetigo in multiple family members or child care attendees.
- Treatment decisions must be made by the patient’s health care provider.

Control Measures
- Contact precautions using barrier protection (gloves) and good hand hygiene when in contact with the lesions. Hand washing after the removal of gloves is required. Cover the lesion with a bandage. Properly dispose of wound dressings.
• Exclusion - A child with impetigo should be excluded from child care until at least 24 hours after beginning appropriate topical and/or systemic antimicrobial therapy. Close contact with other children during this time should be avoided.
Ringworm

Ringworm is a common skin infection that is caused by a fungus. It's called “ringworm” because it can cause a circular rash (shaped like a ring) that is usually red and itchy. Other names for ringworm are based on its location on the body.

- Tinea pedis (Athlete’s foot) – infection of the foot
- Tinea corporis - infection of body

**Tinea capitis – infection of the scalp**

Agent

Various fungal species of *Microsporum*, *Epidermophyton* and *Trichophyton*.

Transmission

Reservoir:

Humans and animals, especially dogs, cats, and cattle. The fungus grows best in warm, moist areas.

Mode of Transmission:

Skin-to-skin contact from infected people or animals; or contact from personal items like combs, contaminated clothing or hats, bedding and towels, and shower or pool surfaces.

Period of Communicability:

As long as lesions are present; viable fungus may persist on contaminated materials for long periods.

Clinical Disease

Incubation Period:

Symptoms typically appear between 4 to 14 days following exposure.

Illness:

Tinea lesions are generally circular, reddish, crusty, and scaly, with a vesiculopapular border; they occur on the face, scalp, and body. Lesions are often itchy. Tinea capitis may present with patchy areas of dandruff-like scaling and hair loss; discrete areas of hair loss with stubs of broken hair; numerous scaly pustules; or a kerion (boggy mass).

Laboratory Diagnosis

Fungal culture and potassium hydroxide wet mount of scrapings from skin lesions.

Treatment

- Tinea corporis and tinea pedis are treated with either topical or systemic antifungal therapy.
- Tinea capitis requires systemic antifungal treatment, usually with oral griseofulvin for at least four weeks. Selenium sulfide shampoo is also often used as adjunctive therapy.

Control Measures

- Contact isolation with the use of barrier protection (gloves) and proper hand hygiene when exposed to potentially infectious lesions. A bandage over the sore is recommended.

- Decontaminate sports equipment or wading pools where the fungus may grow.

- Discourage sharing towels, clothing, combs, brushes or hair ribbons.

- Since pets can be the source of infection, have the family pet evaluated by a veterinarian.

- Educate the children and parents about the method of transmission.

- Exclusion – Children receiving treatment for tinea infections may attend child care or school. Patients with active infection should avoid public areas conducive to transmission (e.g., swimming pools or gymnasiums.)
Scabies

Agent

*Sarcoptes scabiei* is the main cause of human scabies. The mite has no separate existence off the human body (an obligate parasite).

Transmission

Reservoir:

Humans are the source of infestation. Other mites of animals may live on humans but do not reproduce on them.

Mode of Transmission:

Direct, prolonged, close contact with infested skin. Can be acquired during sexual contact.

Period of Communicability:

Until mites and eggs are destroyed by treatment. Ordinarily this is after one or two courses of treatment given a week apart.

Clinical Disease

Incubation Period:

Four to six weeks in people without previous exposure. People who have had previous infestations develop symptoms 1-4 days after re-exposure due to sensitization.

Illness:

Lesions caused by an infestation of mites are characterized by an intensely pruritic, red, vesiculopapular eruption caused by the adult female mites burrowing under the skin to lay eggs. The scabies burrow appears as a gray or white threadlike line. Lesions are commonly found on the finger webs, wrists and elbows, axillary folds, waistline, thighs, naval, genitalia, nipples, abdomen and lower portion of the buttock. In children younger than two years old, the head, neck, palms and soles may be involved. The itching is worse at night and secondary bacterial infections may occur due to group A *Streptococcus* or *Staphylococcus aureus*.

Laboratory Diagnosis

Diagnosis may be established by scraping the mite from its burrow and identifying it microscopically. Often times the burrows have been destroyed by scratching. Prior application of mineral oil or water to the skin facilitates collection of scrapings.

Treatment

- Treatment of choice is topical application of 5% permethrin (Elimite ®), particularly for infants (greater than two months of age), children, and pregnant or nursing women. Apply cream to all portions of the body and wash off by bathing 8-14 hours later. Special attention should be given to trimming fingernails and application of treatment in that area.

- After the cleansing bath is taken, a change is made to clean clothing (and bed sheets). Itching may persist several weeks even with successful treatment. Use of oral antihistamines or topical corticosteroids can help relieve itching. Topical or systemic antimicrobial therapy is indicated for secondary bacterial infections of excoriated lesions.
Because of safety concerns and availability of other treatments, Lindane should not be used for treatment of scabies.

All treatment decisions should be made by the patient’s health care provider. Oral medications may be available after consultation with a healthcare provider.

Control Measures

- Exclude child from child care until the day after treatment has been completed.
- All members of the household should be treated at the same time to prevent reinfection. Manifestations of scabies infestations can appear as late as two months after exposure, during which infected persons can transmit scabies.
- Launder clothing and bed sheets (hot cycle in washer and dryer) used by the patient during the three days prior to initiation of treatment. Items that cannot be washed should be isolated in plastic bags for 7 days. The mites do not survive more than 3-4 days without skin contact.
- Environmental disinfection is unnecessary and unwarranted.
- For scabies among hospitalized patients, contact precautions are recommended until the patient has been treated with an appropriate scabicide.
Rash Illnesses

- Fifth disease
- Hand, foot, and mouth syndrome
- Scarlet fever (under respiratory infections section)

Fifth Disease

**Agent**

Human parvovirus B19.

**Transmission**

Reservoir:

Humans.

Mode of transmission:

Person to person presumably by contact by with respiratory secretions. Rarely transmitted by blood transfusion, direct contact with contaminated blood, or in-uterus transmission from mother to fetus.

Period of communicability:

Greatest before onset of rash and usually noninfectious by the time of rash onset, and/or joint symptoms. Persons with aplastic crisis remain infectious for about a week after onset of symptoms. Persons with immune impairment may remain infectious for a prolonged period.

**Clinical Disease**

**Incubation period:**

Usually 4-14 days, but can be up to 21 days.

**Illness:**

Illness in children is usually mild with a prodrome consisting of low grade or no fever, mild constitutional, respiratory or gastrointestinal signs/symptoms. Slightly raised confluent erythema of the cheeks produces a “slapped cheek” appearance. A faint pink maculopapular rash on the trunk and extremities has a variable, lacy or reticular appearance. This rash may come and go for days to weeks; it tends to appear when the child is hot from sunlight or a bath. Adults may not have a rash, but about 50% have arthralgias or inflammatory arthritis that may last for a few days or persist weeks or months to years. Up to 20% of infected persons have no symptoms.

Hepatitis and myocarditis have been reported in association with parvovirus B19 infection. Persons with chronic hemolytic anemia such as sickle-cell disease may have a transient aplastic crisis as a result of parvovirus B19 infection. Persons with impairment of immune function (such as HIV infection) may develop persistent parvovirus B19 infection with chronic anemia or leukopenia. Transplacental infection of the fetus occurs in about 10% of cases of maternal infection during the first half of pregnancy; fetal demise or stillbirth is associated with fetal hydrops (anemia leading to heart failure). An increased risk of congenital anomalies is not reported.
Laboratory Diagnosis

- Direct detection of parvovirus B19 antigen or deoxyribonucleic acid (DNA) (e.g., polymerase chain reaction (PCR)) in serum or other clinical specimens.
- Detection of parvovirus B19-specific IgM antibody in serum (positive in 90% or more of patients at time of acute illness).

Treatment

- Supportive care for most patients.
- Transfusion may be required for patients with aplastic crisis.
- Chronic infection in immunodeficient patients has been treated with intravenous immunoglobulin.
- Concurrent infection with hydrops fetalis has been treated with intrauterine blood transfusions.

Surveillance

Case Definition:

Formal case definition not established.

Reporting:

Not a reportable condition.

Control Measures

- Children with a rash from fifth disease may attend child care or school since they are not infectious at the time of rash development.
- Transmission of parvovirus B19 is likely reduced through standard cleaning and adherence to recommended hand hygiene practices in childcare settings.
- Pregnant staff should be informed of the potential risks to the fetus of parvovirus B19 infection and about preventive measures to reduce those risks (e.g., adherence to infection control procedures; do not care for immunocompromised patients with chronic parvovirus infection or patients with parvovirus B19-associated aplastic crisis).
- Pregnant women in contact with cases may wish to evaluate their parvovirus B19 immune status.
- The childcare center should identify attendees and staff at increased risk of complications of infection, including persons with chronic hemolytic anemia (most commonly sickle-cell disease) or impaired immune function. These individuals should see a health care provider if they develop signs/symptoms.
Hand, Foot, and Mouth Syndrome

Agent
Hand, foot, and mouth disease (HFMD) is caused by viruses that belong to the Enterovirus genus (group). This group of viruses includes polioviruses, coxsackieviruses, echoviruses, and enteroviruses. Coxsackievirus A16 is the most common cause of hand, foot, and mouth disease in the US, but other coxsackieviruses have been associated with the illness. Enterovirus 71 has also been associated with hand, foot, and mouth disease particularly during outbreaks of HFMD.

Transmission
Reservoir: Humans.
Mode of Transmission:
Most commonly via direct contact with nose and throat secretions and feces of infected persons or through contact with contaminated objects or surfaces.
Less frequently, transmission can occur after swallowing contaminated recreational water sources, like swimming pools. There can also be transmission during the prenatal and peripartum periods.
Period of Communicability:
Respiratory tract viral shedding usually lasts for less than a week of acute infection. Fecal shedding can last for several weeks.

Clinical Disease
Incubation period:
Usually 3 to 6 days.
Illness:
Exanthem consisting of diffuse oral papulovesicular or ulcerative lesions. An exanthem consisting of papulovesicular lesions also may be present on the palms and soles, and other areas of the skin.

Laboratory Diagnosis
Diagnosis is usually clinical. Coxsackievirus can be isolated in viral cultures and polymerase chain reaction (PCR) are available to detect enteroviruses.

Treatment
Supportive.

Control Measures
- Wash hands often with soap and water, especially after changing diapers and using the toilet.
- Clean and disinfect frequently touched surfaces and soiled items, including toys.
- Avoid close contact such as kissing, hugging, or sharing eating utensils or cups with people with hand, foot, and mouth disease.

Children with hand, foot, and mouth syndrome do not need to be excluded from child care unless they are unable to control their oral secretions.
Respiratory Infections

- Conjunctivitis
- Acute viral upper respiratory tract disease
- Noninvasive Group A Streptococcal infection (e.g. ‘strep throat’ (pharyngitis), scarlet fever)
- Viral meningitis

Conjunctivitis

Agent

- Viral – most common; caused by several different viruses, including adenovirus and enterovirus. Conjunctivitis caused by viral agents usually occurs in outbreaks.
- Bacterial – Numerous, including: *Haemophilus influenzae* (non-type b); *Streptococcus pneumoniae*; *Staphylococcus aureus*; *Moraxella catarrhalis*; *Neisseria meningitidis*. In newborn infants: *Chlamydia trachomatis* and *Neisseria gonorrhoeae* are important pathogens.

Transmission

Reservoir:

Humans.

Mode of Transmission:

Direct or indirect contact with the eye secretions of an infected person, or contaminated surfaces or inanimate objects. With viral conjunctivitis, person to person transmission is most noticeable in families, where high attack rates often occur.

Period of Communicability:

Bacterial – During the course of the active infection. Viral – for adenovirus from late in the incubation period to 14 days after onset; for enterovirus at least four days after onset.

Clinical Disease

Incubation Period:

Bacterial – 24-72 hours. Viral – for adenovirus infection, 2-14 days with an average of 8 days; for enterovirus infection, 24-72 hours.

Illness:

Bacterial - excessive tearing, irritation, blood-shot eyes followed by edema of lids and mucopurulent discharge; blurring of vision or photophobia may occur. Viral – sudden onset of redness, swelling, and pain often in both eyes; inflammation of conjunctivae; edema of the lids and periorbital tissue.

Laboratory Diagnosis

Often made clinically, but culture of eye drainage can be performed.
Treatment

Bacterial:
Local application of an antimicrobial ointment or drops. Oral antimicrobial agents are also effective.

Viral:
Conjunctivitis attributable to adenoviruses or enteroviruses is self-limited and requires no specific antiviral therapy. Supportive treatment only.

Control Measures

- Personal hygiene and good hand washing should be emphasized.
- Discourage sharing of personal items like towels, eye or sun glasses or eye make-up.
- Ensure proper disposal of tissues containing eye or nasal drainage.
- Prompt evaluation and treatment of family members of infected person is recommended.
- Proper disinfection of all medical and eye examining equipment is recommended.
- Ensure prompt hand washing before and after eye treatment, administering eye drops or cleansing.
- Exclusion - For schools—except when viral or bacterial conjunctivitis is accompanied by systemic signs of illness, infected children should be allowed to remain in school once any indicated therapy is implemented, unless their behavior is such that close contact with other students cannot be avoided. For child care—conjunctivitis without fever and without behavioral change does not necessitate exclusion. If two or more children in a group care setting develop conjunctivitis in the same time period, seek advice from the program’s health consultant or public health authority.
Acute Viral Upper Respiratory Tract Disease

Agents
Many viruses, including rhinoviruses, coronaviruses, parainfluenza viruses, respiratory syncytial virus (RSV), influenza, adenoviruses, and enteroviruses.

Transmission
Reservoir: Humans.
Mode of Transmission:
Direct oral contact, by droplet, or by inhalation of airborne droplets; indirectly by hands and contact with articles freshly soiled by discharges of nose and throat of infected person. Contaminated hands carrying virus to the mucous membranes of the eye and nose transmit rhinovirus, RSV, and other similar viruses.
Period of Communicability:
Varies by agent; generally most infectious just prior to and during active disease, but shedding of some agents can continue for three weeks.

Clinical Disease
Incubation Period:
Varies by agent; generally several days.
Illness:
An acute infection of the upper respiratory tract characterized by nasal discharge, sneezing, lacrimation, irritated nasopharynx, sore throat, and malaise lasting 2-7 days. Includes conditions such as the common cold, pharyngitis, laryngitis, croup, influenza. Some agents (particularly RSV and influenza) can cause lower airway disease, such as pneumonia and bronchiolitis.

Laboratory Diagnosis
Reverse transcriptase-polymerase chain reaction (RT-PCR) testing, viral cultures or various antigen tests can be used for diagnostic purposes. Nasopharyngeal swabs or washings are used for diagnostic testing.

Treatment
Potential treatment depends on etiology. For the milder forms of viral respiratory illness, supportive treatment is recommended, which may include an antipyretic, an antihistamine, an antitussive, or an analgesic. For more severe illness, it is important for children to be evaluated by their medical provider. There are specific therapies for certain upper respiratory infections, such as influenza. Indiscriminate use of antibiotics for these viral illnesses is discouraged.

Control Measures
• Hand washing is the most effective method of prevention of transmission of respiratory viruses. Proper cleaning of inanimate objects contaminated with oral or nasal discharges is important. The use of disinfectant sprays in the environment is of no proven benefit.

• Acutely ill children should not attend childcare, however, exclusion is not recommended for prevention of transmission of these infections as transmission may occur prior to onset of signs and symptoms, and most illness is mild and self-limited. A child may be excluded if they appear ill, if illness prevents participation in activities (as determined by child care staff), or if the level of care required exceeds the capacity of the child care facility.
Noninvasive Group A Streptococcal Infections

Agent

*Streptococcus pyogenes* (group A Streptococcus).

Transmission

Reservoir:

Humans.

Mode of Transmission:

Contact with respiratory tract secretions of infected persons. Inanimate objects do not play a significant part in the transmission of the disease.

Period of Communicability:

In untreated persons, up to several weeks or months. With adequate antibiotic therapy, communicability terminates after 24 hours.

Clinical Disease

Incubation period:

Usually 2-5 days.

Illness:

Acute onset of fever, sore throat, exudative tonsillitis, tender cervical lymph nodes (“strep throat”), and possibly a diffuse erythematous sandpaper-like rash (“scarlet fever”).

Laboratory Diagnosis

Throat culture or rapid GAS antigen assay from throat swab.

Treatment

Penicillin is the drug of choice in patients who are not allergic to penicillin, but a variety of other antimicrobial agents are also effective. Symptoms usually resolve within 24-48 hours after the start of treatment. Treatment decisions should be made by the patient's health care provider.

Control Measures

- The most important means of reducing spread of noninvasive GAS disease is prompt identification and treatment of infections. Hand washing is recommended after contact with infected persons.
- Exclusion - Children with streptococcal pharyngitis or scarlet fever should be excluded from child care until 24 hours of appropriate antibiotic therapy has been completed.
- Contacts of patients with GAS infections, who have recent or current clinical evidence of GAS infection, should be tested and treated if tests are positive.
Viral Meningitis

Agents
Viral – Numerous, including enteroviruses, arboviruses, herpes simplex, and varicella viruses.

Transmission
Reservoir:
Humans
Mode of Transmission:
For both viral and bacterial meningitis, direct contact with infected secretions from throat or nose.
Period of Communicability:
Viral - many of the viruses have different periods of communicability, but generally persons are most infectious during the acute stage of the illness.

Clinical Disease
Incubation period:
Varies depending on agent.
Illness:
For infants - unusual irritability, excessive crying with an inability to be comforted and high-pitched cry. In children and adults, the severity of signs and symptoms may vary, but sign/symptom complex can include: abrupt onset of fever, chills, intense headache, nausea and vomiting, stiff neck, back pain, malaise, drowsiness, altered consciousness, prostration, and possibly rash. Convulsions may also occur.

Laboratory
Viral – virus may be isolated in culture during early stages from throat washings and stool, and occasionally from cerebral spinal fluid (CSF).

Treatment
Viral - supportive therapy under most circumstances.

Control Measures
- Hand washing is the most important action to prevent transmission of infectious agents.
- Children with suspected meningitis represent a medical emergency and should be immediately evaluated by a health care provider and excluded from child care until the cause of the meningitis is identified. Additional intervention depends on the etiology of the disease.
- Viral - Standard precautions are recommended when in contact with stool, nasal, and throat secretions.
References


Centers for Disease Control. ABCs of safe and healthy child care. Atlanta, GA: Centers for Disease Control; 1996.


# Child Care Center Exclusion List

The following list outlines exclusion for children attending day care centers who develop specific infectious diseases.

<table>
<thead>
<tr>
<th>INFECTION</th>
<th>EXCLUDE?</th>
<th>DURATION OF EXCLUSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS/HIV</td>
<td>NO*</td>
<td></td>
</tr>
<tr>
<td>Campylobacter</td>
<td>YES</td>
<td>Until diarrhea stops</td>
</tr>
<tr>
<td>Chickenpox/varicella</td>
<td>YES</td>
<td>Until all sores are dried and crusted</td>
</tr>
<tr>
<td>Conjunctivitis (pink eye) with white or yellow discharge</td>
<td>YES</td>
<td>Until provider evaluation and approval for return</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>YES</td>
<td>Until diarrhea stops</td>
</tr>
<tr>
<td>Diarrhea – uncontrolled</td>
<td>YES</td>
<td>Until diarrhea stops</td>
</tr>
<tr>
<td>E. coli 0157 (or other STEC)</td>
<td>YES</td>
<td>Until diarrhea stops and 2 negative stool cultures (at least 24 hours apart)</td>
</tr>
<tr>
<td>Giardia</td>
<td>YES</td>
<td>Until diarrhea stops</td>
</tr>
<tr>
<td>Head Lice</td>
<td>NO**</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>YES</td>
<td>Until one week after onset of illness or appearance of jaundice</td>
</tr>
<tr>
<td>Hepatitis B and C</td>
<td>NO*</td>
<td></td>
</tr>
<tr>
<td>Herpes – multiple mouth sores with drooling</td>
<td>YES</td>
<td>Until fever is gone and no drooling</td>
</tr>
<tr>
<td>Herpes – single fever blisters</td>
<td>NO*</td>
<td></td>
</tr>
<tr>
<td>Impetigo</td>
<td>YES</td>
<td>Until 24 hours after treatment has begun</td>
</tr>
<tr>
<td>Mumps</td>
<td>YES</td>
<td>Until 5 days after onset of parotid gland swelling</td>
</tr>
<tr>
<td>Pertussis</td>
<td>YES</td>
<td>Until 5 days of appropriate antibiotic therapy has been completed</td>
</tr>
<tr>
<td>Rash Illness with fever</td>
<td>YES</td>
<td>Until provider determines not contagious</td>
</tr>
<tr>
<td>Condition</td>
<td>Duration</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Ringworm (scalp &amp; body)</td>
<td>NO***</td>
<td></td>
</tr>
<tr>
<td>Rubeola (measles)</td>
<td>YES Until 4 days from appearance of rash</td>
<td></td>
</tr>
<tr>
<td>Rubella</td>
<td>YES Until 6 days from appearance of rash</td>
<td></td>
</tr>
<tr>
<td>Salmonella</td>
<td>YES Until diarrhea stops</td>
<td></td>
</tr>
<tr>
<td>Scabies</td>
<td>YES Until after treatment has been given</td>
<td></td>
</tr>
<tr>
<td>Shigella</td>
<td>YES Until diarrhea stops and 2 negative stool cultures (at least 24 hours apart and at least 48 hours after antibiotics completed)</td>
<td></td>
</tr>
<tr>
<td>Shingles</td>
<td>YES Unless lesions can be covered or they are crusted</td>
<td></td>
</tr>
<tr>
<td>Staphylococcus skin lesions</td>
<td>NO****</td>
<td></td>
</tr>
<tr>
<td>Streptococcal Pharyngitis (Strep throat)</td>
<td>YES Until 24 hours after treatment has begun</td>
<td></td>
</tr>
<tr>
<td>Fever with behavioral changes</td>
<td>YES Until after provider evaluation and fever subsides</td>
<td></td>
</tr>
<tr>
<td>Vomiting (&gt;= 2 times in 24 hours)</td>
<td>YES Until vomiting subsides</td>
<td></td>
</tr>
</tbody>
</table>

*Unless child shows aggressive behaviors like biting, or scratching, or has draining skin lesions, or bleeding problems.

**Chemical treatment of the hair is nonetheless highly recommended.

***If using topical treatment and lesions covered.

****Only if skin lesions draining and cannot be covered with watertight dressing.

**References**

What are bed bugs?
Bed bugs are very small (about ¼-inch long) reddish-brown, wingless insects that feed on warm-blooded animals, which are typically humans, although other mammals and birds can be used in the absence of a human host. During the day, they usually hide, but they come out at night to feed on the host’s blood while the host is sleeping. Bed bugs can live a long time without food (blood.)

What are signs that you have bed bugs?
Bed bugs cause a person to have welts and areas of irritation where a bed bug bite occurred. These bites can be on any bare skin. Some signs that you may have bed bugs, or an infestation, are smears of blood on your pillow, sheets, and blankets, or bed bugs present in the fold of mattresses and sheets. There may also be a strange, sweet-musty odor that develops in your bedding.

How are bed bugs spread?
Bed bugs do not fly. They crawl to bite a host and obtain blood. During the day, they usually hide in cracks or very small openings close to their host. Then at night, they have a very short crawl for their blood meals. This is why they are frequently found in beds – mattresses have many tiny spaces and are very close to a human host.

Bed bugs can also “hitchhike” and hide in luggage, clothing, furniture, etc. This is why infestations with bed bugs can be a problem at homeless shelters or motels/hotels where there is a high turnover of occupants. Animals, such as pets or mice in an attic, may also bring bed bugs into the home.

Who gets bed bugs?
Anyone can get bed bugs. Bed bugs can affect people of any age, gender, race or level of cleanliness. Even if a person has had a bed bug infestation before, a person can be infested again if they are exposed to the bugs.

What treatment is available for people with bed bugs?
No specific treatment is available. Bed bugs do not generally cause illness. Persons may sometimes use products to lessen the itching and redness from the bugs’ bites.

Do people with bed bugs need to be kept home from school, work or daycare?
Persons with bed bugs do not need to be kept home.

How can I rid my home of bed bugs?
Getting rid of bed bugs is very hard, and many people call pest control companies to help them. Here are some things you can try on your own:

- Clean infested bedding and clothing by using hot water, hot dryers, or by dry cleaning. Items that cannot be cleaned should be bagged in plastic and placed in the sun for several days.
- Reduce clutter in order to lessen the number of places the bugs can hide.
- Vacuum sites with signs of infestation using a suction hose-attachment on your vacuum cleaner.

How can I protect myself and my family from getting bed bugs?

- Avoid picking up furniture from the curbside that was left for garbage.
- Carefully inspect second hand furniture for signs of bed bugs (e.g., brown smears.)
- When traveling, carefully inspect your bed (bed sheets and seams of the mattress) for signs of bed bugs and request a new room if you see signs.
- When traveling, place your luggage on a luggage stand.
¿Qué son los chinches?
Los chinches son insectos muy pequeños (como medio centímetro o un cuarto de pulgada de largo), rojos o marrones, sin alas que se alimentan de animales de sangre caliente, típicamente de humanos, aunque otros mamíferos o aves pueden ser usados si no hay humanos cerca. Durante el día, normalmente se esconden, pero salen por la noche para chupar la sangre del animal mientras éste duerme. Las personas pueden convertirse en “víctimas” de los chinches, a esta persona se la llama huésped. Los chinches pueden vivir mucho tiempo sin comida (sangre).

¿Cuáles son las señales que dejan los chinches?
En el lugar donde se produjeron las picaduras de los chinches aparecen marcas e irritación. Estas picaduras pueden darse en cualquier lugar de la piel que esté descubierto. Si encuentra manchas de sangre en su almohada, sábanas, mantas o cobijas, o chinches en los dobleces del colchón o las sábanas puede ser una señal de que hay chinches o una infestación. También es posible que haya un olor extraño (dulzón) en su ropa de cama.

¿Cómo se propagan los chinches?
Los chinches no vuelan. Andan hasta su víctima y obtienen sangre. Durante el día, se suelen esconder en las grietas o pequeños huecos que están cerca de su víctima. De esta forma, cuando llega la noche, no tienen que andar mucho para conseguir su comida. Por eso se encuentran con frecuencia en la cama, por ejemplo, los colchones tienen muchos pequeños lugares para esconderse y están cerca de la persona. Los chinches también pueden “viajar” con usted y esconderse en maletas, ropa, muebles, etc. Es por esto que las infestaciones de chinches pueden ser un problema en albergues para personas sin hogar o en moteles/hoteles por donde pasan muchas personas. Los animales, como por ejemplo las mascotas o los ratones en el altillo, también pueden traer chinches a la casa.

¿Quién puede tener chinches?
Cualquier persona puede tener chinches. Los chinches pueden afectar a personas de cualquier edad, sexo, raza o grado de higiene. Incluso si una persona ya ha tenido una infestación antes, puede volver a infestarse otra vez si existe exposición a los chinches.

¿Cómo se tratan las picaduras de chinches?
No hay un tratamiento específico para las picaduras. Los chinches, por lo general, no causan ninguna enfermedad. A veces se pueden usar productos para aliviar la picazón e irritación que causan las picaduras.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo si se tiene chinches?
Las personas que tienen chinches no necesitan quedarse en casa.

¿Cómo puedo eliminar los chinches de mi casa?
Eliminar los chinches es muy difícil y muchos llaman a compañías de fumigación para que les ayuden. Estas son algunas de las cosas que usted puede intentar:
- Lave toda la ropa de cama y otra ropa infestada con agua caliente, use la secadora con temperatura caliente o lleve la ropa para que la limpiel en seco. Las cosas que no se puedan limpiar, deben ponerse dentro de bolsas de plástico cerradas y ponerlas al sol por varios días.
- No abarrote el cuarto con objetos para que haya menos lugares donde los chinches se puedan esconder.
- Pase la aspiradora en lugares donde haya señales de infestación, use el tubo para aspirar.

¿Cómo puedo protegerme yo y también proteger a mi familia contra los chinches?
- Evite llevar a su casa muebles que estaban abandonados en la calle o en la basura.
- Inspeccione con cuidado cualquier mueble de segunda mano para ver si tiene señales de chinches (como manchas marrones).
- Cuando viaje, inspeccione su cama (las sábanas y las costuras del colchón) para ver si hay señales de chinches y pida que le den otra habitación si ve alguna señal.
- Cuando viaje, coloque su maleta en el portaequipaje de la habitación.
What are head lice?
When a person has head lice, they have *Pediculous humanus capitus in their hair*. Head lice are tiny insects (up to 3mm long) that live in human hair and feed on human blood. They reproduce quickly. Their eggs (called nits) are small, and they are usually found at the base of the hair, close to the scalp.

What are the symptoms of head lice?
One possible sign of head lice is a constant itching of the scalp. Sometimes a person with head lice will have infected scratch marks or what appears to be a rash on the scalp. At times people will not have any itching, especially when lice are newly arrived to the head.

How are head lice spread?
Head lice have no wings and do not fly or jump; they crawl. They are spread through direct head to head contact with an infested person. Head lice are rarely spread via shared items such as combs, brushes, towels, pillowcases, hats, helmets, other headgear, and clothing.

How long are people contagious?
Head lice may be spread as long as lice or eggs remain alive on the infested person or in clothing.

Who gets head lice?
Anyone with hair can get head lice.

What treatment is available for people with head lice?
Chemical treatment should be given only to people who have active lice. The presence of nits (eggs) is not a sign of active infestation. Medicated shampoos (i.e. RID®, A-200®, Clearlice®, or Nix® brands) are available without a prescription. Follow the instructions on the package. Non-chemical treatment involves applying hair conditioner to wet washed hair, then combing with a louse comb (special fine-toothed comb). The caregiver sections off the hair and removes the lice a section at a time combing from the scalp out. Rinse and dry the hair once the entire head has been combed. Repeat this process every two days over a 10-day period. Recheck the head for re-infestation once a week for one month. If adult lice are found, then restart the combing process with the fine-toothed comb. Check all household members for live lice and nits and treat using this same regime.

Kerosene, oil, or pet shampoo should NOT be used to treat a lice infestation. Treatment requiring prescriptions from health care provider(s) may be necessary in some cases.

Do infected people need to be kept home from school, work or daycare?
No.

How can I protect myself and my family from getting head lice?
If someone in a family has head lice, the hair of everyone in the household should be checked. Everyone with head lice in the same household should be treated on the same day.

Only items contacting the head of the person with lice in the previous 24 hours need to be cleaned. Head lice survive less than 2 days (48 hours) if they fall off a person.
¿Qué son los piojos?
Cuando una persona tiene piojos en la cabeza, lo que tiene es *Pediculus humanus capitis* en su pelo. Los piojos son insectos muy pequeños (son como una semilla de ajonjoli, de 2 a 4 mm) que viven en el pelo de las personas y se alimentan de sangre humana. Se reproducen muy rápido. Los huevos, se llaman liendres, son muy pequeños y se suelen encontrar cerca de la raíz del pelo. Los piojos no transmiten ninguna enfermedad.

¿Cuáles son los síntomas si se tienen piojos en la cabeza?
Una señal de que puede haber piojos es la picazón en la cabeza. A veces una persona que tiene piojos puede tener marcas infectadas causadas por rascarse o como una especie de sarpullido.

¿Cómo se transmiten los piojos?
Los piojos de la cabeza no tienen alas y no vuelan ni saltan; se arrastran. Se transmiten por contacto directo con una persona infestada o si se comparten peines, cepillos, toallas, almohadas, gorros, audífonos u otros artículos para la cabeza y ropa.

¿Por cuánto tiempo puede una persona con piojos contagiar a otros?
Es contagioso mientras las liendres o huevos en la cabeza de la persona infestada o en su ropa estén vivos.

¿A quién puede afectar?
Los piojos pueden infectar a cualquier persona. No son una señal de poca higiene o suciedad.

¿Cómo se trata una infestación por piojos en la cabeza?
El tratamiento se debe dar sólo a personas que tienen huevos o piojos de forma activa. Hay medicinas en forma de champú (como RID, A-200, Clear o Nix) que se venden sin receta médica. Siga las instrucciones que vienen con el champú. Después de aplicarlo, elimine las liendres con un peine especial (“lendrera”) o un peine metálico de púas finas. Se recomienda un segundo tratamiento entre 7 y 10 días después del primero para asegurarse de que no quedaron piojos vivos. Se debe mirar bien el pelo y quitar todas las liendres todos los días durante 2 semanas para asegurarse de que no regresen. Revise el pelo, en pequeñas secciones, usando una luz fluorescente o una lupa para que sea más fácil encontrar las liendres.

NO use queroseno, aceite o champú para animales para tratar una infestación con piojos en la cabeza. En algunos casos, puede ser necesario seguir tratamiento con medicamentos recetados por un proveedor de salud.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
No.

¿Cómo puedo protegerme yo y proteger a mi familia contra una infestación de piojos?
- Si alguien en la familia tiene piojos en la cabeza, todos deben chequear su pelo. Todos los que tengan piojos deben recibir el tratamiento con el champú el mismo día. Las toallas que se usen para secar el pelo después de usar el champú contra los piojos deben lavarse de inmediato.
- Si alguien en la familia tiene piojos, lávelo todo la ropa, ropa de cama y peluches con agua caliente, use la secadora bien caliente (por al menos 20 minutos) o llévelos todo a que lo laven en seco. Ponga las cosas que no se puedan lavar en bolsas de plástico cerradas y déjalas por dos semanas. Pase la aspiradora en el piso, los muebles, los asientos del carro y las alfombras. No se recomienda el uso de insecticidas.
- Para desinfectar los peines y cepillos, sumérjelos en champú contra piojos por 4 minutos, en una solución desinfectante como Lysol por una hora, o hiévelos en agua por 10 minutos.
- Dígales a los niños que no compartan gorros, abrigos, peines u otros artículos en la escuela.
What is ringworm?
Ringworm is a disease of the skin caused by a fungus.

What are the symptoms of ringworm?
Ringworm usually shows itself as crusty yellow sores (lesions) that are usually circular. They can occur on the face, body and scalp. When they appear on the scalp, they may produce dandruff-like flakes and hair loss.

How is ringworm spread?
Ringworm is spread through direct contact with an infested person or animals or with shared items such as combs, brushes, hair ribbons, or headgear.

How long are people contagious?
Persons can spread the fungus as long as they have the ringworm sores.

Who gets ringworm?
Anyone can get ringworm. It can affect people of any age, gender, race or level of cleanliness. Even if a person has had a ringworm infestation before, s/he can be infested again if they are exposed to the fungus. Outbreaks of ringworm may occur in nursing homes, institutions and child care centers.

What treatment is available for people with ringworm?
Your doctor can prescribe medicated skin lotions or shampoos to treat ringworm. These medications should be used exactly as described by your health care provider. Trim fingernails and clean under them to remove any fungus.

Do infected people need to be kept home from school, work or daycare?
No. Infected persons may go to school, work or day care. However, if they have open sores or their sores are leaking fluid, they should cover the sores with a bandage when possible. They should also avoid activities where they are likely to spread the fungus (e.g., gym or swimming).

How can I protect myself and my family from getting ringworm?
- If someone in a family has ringworm, everyone in the household should be checked.
- Promptly clean “dirtied” or contaminated surfaces or objects (e.g., sports equipment) with household chlorine bleach cleaners.
¿Qué es la tiña?
La tiña es una enfermedad de la piel producida por hongos.

¿Cuáles son los síntomas de la tiña?
Normalmente la tiña se reconoce porque aparecen costras (lesiones en la piel) amarillas que suelen tener forma circular. Pueden aparecer en la cara, el cuerpo o el cuero cabelludo. En el cuero cabelludo, puede producir escamas parecidas a la caspa y pérdida del cabello.

¿Cómo se transmite la tiña?
La tiña se transmite por contacto directo con personas o animales infectados, o al compartir peines, cepillos, cintas para el pelo o artículos para la cabeza (gorros sobre todo).

¿Por cuánto tiempo puede alguien con tiña contagiar a otros?
Las personas pueden transmitir estos hongos mientras tengan las costras de la tiña.

¿Quién puede contraer la tiña?
Cualquier persona puede contraerla. Puede afectar a personas de cualquier edad, sexo, raza o grado de higiene. Incluso si ya se tuvo tiña antes, se puede volver a tener tiña si se está expuesto a estos hongos otra vez. Los brotes de tiña pueden ocurrir en residencias de ancianos, instituciones y guarderías.

¿Cómo se trata la tiña?
Su médico le puede recetar lociones médicas para la piel o champús para tratar la tiña. Debe usar estas medicinas exactamente tal y como le explique su médico. Córtense las uñas y limpie debajo de ellas para eliminar los hongos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
No. Las personas infectadas pueden ir a la escuela, al trabajo o a la guardería. Sin embargo, si tienen heridas abiertas o que están echando líquido, deben cubrirlas con una venda si es posible. También deben evitar actividades en las que puedan transmitir los hongos a otras personas (por ejemplo, en la piscina o en el gimnasio).

¿Cómo puedo protegerme yo y proteger a mi familia contra la tiña?
• Si alguien en su familia tiene tiña, todos deben chequearse para ver si están infectados.
• Limpie de inmediato superficies u objetos contaminados o “sucios” (por ejemplo equipo deportivo) con un limpiador para la casa que contenga cloro.
What is scabies?

Scabies is a disease of the skin caused by a mite. Scabies mites burrow or dig into the skin producing pimple-like irritations or burrows. This is called an ‘infestation’. These mites cannot live more than three days without skin contact.

What are the symptoms of scabies?

Severe itching, especially at night, is the most common symptom of scabies. A sign of infestation includes small raised red bumps, blisters or rashes. The areas of the skin most often affected by scabies include the webs and sides of the fingers, around the wrists, elbows, armpits, waist, thighs, genitalia, breasts and lower buttocks. Persons with scabies sometimes develop skin infections due to scratching – signs and symptoms of skin infections include redness, warmth, pain/tenderness, swelling and pus at the site of infection. The first time a person gets scabies, the itching begins in 4 to 6 weeks. If a person has had scabies before, s/he is more sensitive, and symptoms appear much more quickly, often within 1 to 4 days.

How is scabies spread?

Scabies is usually spread through prolonged, close personal contact. For example, persons who share a bed or who have sex together are more likely to spread scabies to one another.

How long are people contagious?

Persons with scabies infestations may spread the mite as long as they are infested and untreated.

Who gets scabies?

Anyone can get scabies. Scabies can affect people of any age, gender, race or level of cleanliness. Even if a person has had a scabies infestation before, s/he can be infested again if exposed to the mites. Outbreaks of scabies may occur in nursing homes, institutions and child care centers.

What treatment is available for people with scabies?

Your doctor can prescribe medicated skin lotions to treat scabies. These medications should be used exactly as described by your health care provider. Trim fingernails and clean under them to remove any mites or eggs. Persons who have had skin contact with an infested person (including family members, roommates, and sexual contacts) should also be treated at the same time as the infested person. Sometimes, itching may last for as long as several weeks after effective treatment. Antihistamine or steroid medicines may reduce the itching. Skin infections may require antibiotic therapy.

Do infected people need to be kept home from school, work or daycare?

People should be kept home until the day after treatment with the medicated lotion.

How can I protect myself and my family from getting scabies?

- If someone in a family has scabies, everyone in the household should be checked. Everyone with scabies in the same household should be treated on the same day.

- The clothing of persons infested with scabies and worn within three days of treatment, and their bed linens, should be washed in hot water and dried in a hot dryer. Articles that cannot be washed may be dry-cleaned or bagged in plastic for seven days.
¿Qué es la sarna?
La sarna es una enfermedad de la piel causada por un ácaro (parecido a una pequeña araña). Los ácaros de la sarna excavan dentro de la piel para hacer su madriguera y así producen irritaciones como un sarpullido con granos. Esto es una ‘infestación’. Estos ácaros no pueden vivir más de tres días sin contacto con la piel.

¿Cuáles son los síntomas de la sarna?
Se caracteriza por una picazón muy intensa, sobre todo por la noche. Una señal de que hay una infestación es la aparición de pequeños granos rojos, ampollas o ronchas. Las áreas de la piel más afectadas por la sarna son las manos (entre los dedos), muñecas, codos, axilas, cintura, muslos, genitales, senos y nalgas. Las personas con sarna a veces desarrollan una infección en la piel por rascarse, algunos de los síntomas de una infección en la piel son enrojecimiento, sensación de calor, dolor, hinchazón y pus en el lugar de infección. La primera vez que una persona tiene sarna, la picazón comienza después de 4 a 6 semanas. Si la persona ya tuvo sarna antes, es más sensible y los síntomas aparecen más rápido (de 1 a 4 días).

¿Cómo se transmite la sarna?
La sarna se transmite por contacto cercano y prolongado con otra persona infectada. Por ejemplo, las personas que comparten la cama o tienen relaciones sexuales pueden pasarse la sarna fácilmente.

¿Por cuánto tiempo puede alguien con sarna contagiar a otros?
Las personas infestadas pueden transmitir el ácaro de la sarna mientras sigan teniendo la infestación y no reciban tratamiento.

¿Quién puede contraer la sarna?
Cualquiera puede contraerla. La sarna puede afectar a personas de cualquier edad, sexo, raza o grado de higiene. Incluso si una persona ya tuvo sarna antes, puede volver a tener otra infestación si está expuesta a los ácaros otra vez. Los brotes de sarna pueden ocurrir en residencias de ancianos, instituciones y guarderías.

¿Cómo se trata la sarna?
Su médico le puede recetar lociones para la piel que tratan la sarna. Estas medicinas se deben usar tal y como le indique su médico. Córtese las uñas y limpíe debajo de ellas para eliminar cualquier ácaro o huevos de éstos. Las personas que tuvieron contacto con la piel de una persona infestada deben recibir el tratamiento al mismo tiempo que esa persona (esto incluye miembros de la familia, compañeros de cuarto y parejas sexuales). A veces, la picazón puede durar por varias semanas después de haber recibido el tratamiento adecuado. Los antihistamínicos o esteroides pueden reducir la picazón. Si hay infecciones en la piel, puede que sea necesario tratar con antibióticos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas infestadas deben quedarse en casa hasta haber completado un día de tratamiento con la loción médica.

¿Cómo puedo protegerme yo y proteger a mi familia contra la sarna?
- Si alguien en la familia tiene sarna, todos en la casa deben chequearse. Todos los que tengan sarna en la misma casa deben tratarse con la loción el mismo día.
- Debe lavar con agua caliente y secar en la secadora con la temperatura alta la ropa de las personas infestadas con sarna y que usaron los tres primeros días de tratamiento con la loción, de igual forma se debe lavar su ropa de cama. Si hay artículos que no se puedan lavar, se pueden llevar a limpiar en seco o se deben poner en bolsas de plástico por siete días.
What is fifth disease?
Fifth disease is caused by a human parvovirus called B19.

What are the symptoms of fifth disease?
Symptoms usually begin 4 to 14 days after exposure to the virus, but they can take as long as 21 days to appear. Symptoms may include a mild fever, tiredness, and headache. The most common symptom is the appearance of a rash. The rash has been described as “lacey” and may give the appearance of someone having slapped cheeks. The rash can also develop on the trunk and extremities (arms and legs). Infrequently, persons may also develop problems with their lungs, stomach and/or joints.

How is Fifth disease spread?
It is spread from person to person by direct contact with nose and throat discharges of infected persons. Another way to get Fifth disease is by touching objects that are freshly soiled by the infected person's nose and throat discharges. Less often, it can be spread through blood transfusions, direct contact with contaminated blood, or in utero transmission from mother to fetus.

How long are people contagious?
Fifth disease is moderately contagious. Persons are usually the most contagious before their rash develops. In cases where a person develops aplastic crisis, a more severe effect of Fifth disease, s/he may continue to be contagious for as long as a week after symptoms appear. Persons with weak immune systems may also be contagious for longer periods of time.

Who gets Fifth disease?
Anyone can get Fifth disease. Everyone is at risk of infection, but not everyone who is infected becomes ill. Once a person has had Fifth disease, they will not get it again. Outbreaks may occur in schools and child care centers.

What treatment is available for people with Fifth disease?
No specific treatment is available for Fifth disease. Most infections do not need treatment. If a pregnant woman is exposed to someone with Fifth disease or gets the illness, she should contact her doctor immediately.

Do infected people need to be kept home from school, work or daycare?
Generally, persons with Fifth disease do not need to be kept home. This is because once a person is known to have Fifth disease, as evidenced by the rash, s/he is no longer contagious. In special instances, a person who is hospitalized for Fifth disease may need special care.

How can I protect myself and my family from getting Fifth disease?
- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Clean “dirtied” or contaminated surfaces and soiled items first with soap and water, and then disinfect them with a dilute solution of chlorine-containing bleach (made by mixing approximately ¼ cup of bleach with one gallon of water).
¿Qué es la quinta enfermedad?
El parvovirus B19 es el virus humano que causa la quinta enfermedad.

¿Cuáles son los síntomas de la quinta enfermedad?
Los síntomas generalmente comienzan entre 4 y 14 días después de haber estado expuesto al virus, pero también pueden tardar hasta 21 días en aparecer. Los síntomas incluyen fiebre baja, cansancio y dolor de cabeza. El síntoma más común es la aparición de un sarpullido. El sarpullido tiene forma de encaje y en las mejillas parece como si le hubieran abofeteado. El sarpullido se desarrolla en el tronco y las extremidades (los brazos y las piernas). De forma menos frecuente, también puede afectar a los pulmones, el estómago o las articulaciones.

¿Cómo se transmite la quinta enfermedad?
Se transmite de persona a persona por contacto directo con las secreciones respiratorias (saliva, esputo y el moco nasal) de personas infectadas. Otra forma de contraer esta enfermedad es al tocar objetos que acaban de ensuciarse con las secreciones respiratorias (saliva, esputo o moco) de las personas infectadas. Con menor frecuencia, se puede transmitir mediante transfusiones de sangre, por contacto directo con sangre infectada, o por transmisión intrauterina de madre a feto.

¿Por cuánto tiempo puede alguien contagiar a otros?
La quinta enfermedad es moderadamente contagiosa. Antes de que se desarrolle el sarpullido es cuando la persona infectada es más contagiosa. En los casos en los que la persona desarrolla una crisis aplásica, una afección más grave de la quinta enfermedad, el riesgo de contagio continuará hasta una semana después de la aparición de los síntomas. Las personas que tienen su sistema inmunológico debilitado pueden ser contagiosas durante un período de tiempo más largo.

¿Quién puede contraer la quinta enfermedad?
Cualquier persona puede contraer la quinta enfermedad. Cualquiera puede tener el riesgo de contraer la infección, pero no todos los infectados se enferman. Una vez que la persona ya pasó la enfermedad, no la volverá a pasar. Los brotes pueden ocurrir en escuelas y guarderías.

¿Cómo se trata la quinta enfermedad?
No hay un tratamiento específico para la quinta enfermedad. La mayoría de las infecciones no necesitan ningún tratamiento. Si una mujer embarazada entra en contacto con alguien que tiene esta enfermedad o si contrae la enfermedad, debe contactar a su médico inmediatamente.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Por lo general, las personas con la quinta enfermedad no necesitan quedarse en casa. Para cuando aparece el sarpullido que indica la existencia de la enfermedad, la persona ya no es contagiosa. En algunos casos concretos, la persona puede necesitar hospitalización y cuidados especiales.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la quinta enfermedad?
- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Limpie las superficies contaminadas o “sucias” y otros objetos ensuciados primero con agua y jabón, y después desinféctelos con una solución diluida de agua con cloro (se hace mezclando aproximadamente un cuarto de taza de cloro por cada galón de agua).
What is hand, foot and mouth disease?
Hand, foot and mouth disease (HFMD) is a common illness of infants and children. A group of viruses called enteroviruses causes the illness. HFMD is often confused with foot-and-mouth disease of cattle, sheep and swine. Although the names sound alike, the two diseases are not related at all and are caused by different viruses.

What are the symptoms of hand, foot, and mouth disease?
Symptoms usually begin 3 to 6 days after exposure to the virus. Symptoms may include fever, a sore throat, sores in the mouth, and a rash with blisters. The skin rash appears as flat or raised red spots, some with blisters. The rash does not itch, and it is usually seen on the palms of the hands and soles of the feet.

How is hand, foot and mouth disease spread?
It is spread from person to person by direct contact with nose and throat secretions, saliva, fluid from blisters, or the stool of infected persons. Another way to get HFMD is by touching articles that are freshly soiled by the infected person's sores or blisters.

How long are people contagious?
HFMD is moderately contagious. A person is most contagious during the first week of the illness. A person may shed the virus for weeks; even if s/he is no longer ill.

Who gets hand, foot and mouth disease?
HFMD occurs mainly in children under 10 years old but may also occur in adults. Everyone is at risk of infection, but not everyone who is infected becomes ill. A person can become ill more than once with HFMD because there are different viruses that cause this illness.

What treatment is available for people with hand, foot and mouth disease?
No specific treatment is available for this type of virus. Treatment is given to provide relief from fever, aches, or pain from the mouth ulcers.

Do infected people need to be kept home from school, work or daycare?
Generally, persons with HFMD do not need to be kept home. Ill persons should pay special attention to properly washing their hands.

How can I protect myself and my family from getting hand, foot, and mouth disease?
- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Clean “dirtied” or contaminated surfaces and soiled items first with soap and water, and then disinfect them with a dilute solution of chlorine-containing bleach (made by mixing approximately ¼ cup of bleach with one gallon of water).
- Avoid close contact (e.g. kissing, hugging, sharing utensils) with children with HFMD.
¿Qué es la enfermedad de mano-pie-boca?

La enfermedad de mano-pie-boca es una enfermedad común en bebés y niños. El grupo de virus enterovirus es el que causa esta enfermedad. A veces se confunde con la enfermedad de pie y boca de las vacas, las ovejas y cerdos. Aunque los nombres son similares, las dos enfermedades no están relacionadas y el virus que las causa es diferente.

¿Cuáles son los síntomas de la enfermedad de mano-pie-boca?

Los síntomas normalmente comienzan entre 3 y 7 días después de haber estado expuesto al virus. Los síntomas incluyen fiebre, dolor de garganta, úlceras en la boca y un sarpullido con ampollas. El sarpullido en la piel puede aparecer con puntos rojos planos o elevados, algunos con ampollas. El sarpullido no pica y, por lo general, se encuentra en las palmas de las manos y plantas de los pies.

¿Cómo se transmite la enfermedad de mano-pie-boca?

Se transmite de persona a persona por contacto directo con las secreciones de la nariz y la garganta, la saliva, el líquido de las ampollas o las heces de personas infectadas. También se puede contraer esta enfermedad al tocar artículos que han estado en contacto con las ampollas o úlceras de la persona infectada.

¿Por cuánto tiempo puede alguien contagiar a otros?

La enfermedad de mano-pie-boca es moderadamente contagiosa. Durante la primera semana es más contagiosa, pero se puede transmitir el virus incluso semanas después de ya no estar enfermo.

¿Quién puede contraer la enfermedad de mano-pie-boca?

Esta enfermedad es más frecuente en niños menores de 10 años, pero también puede ocurrir en adultos. Cualquiera corre el riesgo de contraerla, pero no todos los que la pasan se enferman. Una persona puede contraer esta enfermedad más de una vez porque hay diferentes virus que la causan.

¿Cómo se trata la enfermedad de mano-pie-boca?

No hay un tratamiento específico para este tipo de virus. Se puede proporcionar tratamiento para aliviar los síntomas de la fiebre, el malestar y el dolor de las úlceras en la boca.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?

Normalmente las personas con la enfermedad de mano-pie-boca no necesitan quedarse en casa. Las personas que están enfermas deben llevar especial cuidado y lavarse bien las manos.

¿Cómo puedo protegerme yo y proteger a mi familia contra la enfermedad de mano-pie-boca?

- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Limpie las superficies "sucias" o contaminadas y otros objetos ensuciados primero con agua y jabón, y después desinféctelos con una solución diluida de agua con cloro (se hace mezclando aproximadamente un cuarto de taza de cloro por cada galón de agua).
- Evite el contacto cercano (al besar, abrazar, compartir utensilios) con niños que tienen la enfermedad de mano-pie-boca.
Cholera

Summary
Classic cholera is a condition of severe gastroenteritis occurring in outbreaks with a high mortality rate in untreated patients. All strains of *Vibrio cholerae* and non-cholera *vibrio* can cause asymptomatic infections or sporadic cases of gastroenteritis. Some *Vibrio* species can cause sepsis and/or severe cutaneous infections.

Agent
Cholera is caused by *Vibrio cholerae*, type O1 and O139 that produce cholera toxin. Non-cholera-toxigenic O1 and non O1 strains and non-cholera *vibrio* may be associated with watery diarrhea.

Transmission
Reservoir:
Reside in salt or brackish waters and in crustaceans in contaminated water. There is no long-term human carriage, and no non-human mammal or bird reservoir.

Mode of transmission:
Through ingestion of food or water contaminated directly or indirectly with feces or vomitus of an infected person. Seafood may be surface contaminated by salt water or intrinsically contaminated by harvesting from contaminated waters. Secondary contamination of uncooked food may cause large outbreaks. Usually not transmitted directly from person to person.

Period of communicability:
As long as stools are positive for the organism, usually for only a few days after recovery. Carriage for several months and extended biliary carriage has been reported rarely.

Clinical Disease
Incubation period:
Usually 1-3 days, range few hours to 5 days.

Illness:
The majority of *V. cholerae* infections are subclinical, and mild to moderate diarrhea is common, especially in children. Classic cholera involves the abrupt onset of diarrhea without abdominal pain, cramping or fever; feces are typically watery, voluminous, described as 'rice-water' because they are colorless with shreds of mucous. The volume of enteric output may reach several liters over several hours resulting in fulminant dehydration, hypokalemia, acidosis, hypovolemic shock, coma, and seizures. Death occurs within 12 hours in up to 50% of untreated cases of cholera gravis. Vomiting occurs in many cases. Hypoglycemia may occur in children. Oral rehydration with replacement of electrolytes and provision of carbohydrates to facilitate resumption of normal epithelial cell function will permit the recovery of most patients.

Laboratory Diagnosis
- Maximum yield from fecal, rectal swab, or vomitus culture requires either immediate plating of the specimen on Thiosulfate-citrate-bile salts-sucrose (TCBS) (or similar) agar or transport of the specimen in Cary-Blair transport medium. *Vibrio* species will grow...
readily on blood agar but are inhibited by most media that are used for routine culture for *Salmonella* and *Shigella*. The laboratory should be notified when infection with a vibrio species is suspected, since appropriate media is not used routinely by most clinical labs. Vibrio species are readily recovered from routine blood and tissue cultures.

- Retrospective serologic diagnosis can be made by detection of vibriocidal antibodies or antibodies to cholera toxin.

### Treatment

- Institute oral or parenteral rehydration and replacement of electrolytes immediately.
- Antibiotic treatment is recommended in moderately to severely ill patients and will reduce severity of illness and decrease excretion of the organism in the stool. Adults may be treated with doxycycline while azithromycin is recommended as first-line treatment for children and pregnant women. or tetracycline for three days. Strains resistant to tetracyclines should be treated with a trimethoprim/sulfamethoxazole (TMP/SMX) or a fluoroquinolone.

### Surveillance

**Case Definition:**

*Laboratory criteria -* Positive culture of stool or vomitus for toxigenic *V. cholerae* O1 or O139 or serologically by at least a fourfold change in titer of vibriocidal or anti-toxic antibodies in acute/convalescent sera.

*Confirmed* – A clinically compatible illness that is laboratory confirmed.

**Reporting:**

Report all suspected or confirmed cases of cholera immediately to the Epidemiology and Response Division (ERD) at 505-827-0006, who will also report to CDC. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. CDC will confirm the identity and serotype (O antigen and toxin) of *V. cholerae* isolates. Cholera is immediately reportable to the World Health Organization (by CDC).

Case Investigation: Use the CDC Cholera and Vibrio Form 52.79 to complete the investigation and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Information should also be entered into NM-EDSS per established procedures.

### Control Measures

1. **Case management**
   1.1. Isolation: Contact precautions for the duration of illness.
   1.2. Prophylaxis: Not applicable.

2. **Contact management**
   2.1. Isolation: None required.
   2.2. Prophylaxis – Usually not indicated. Close surveillance for five days after the last meal shared with the index case. If there is evidence or high likelihood for secondary transmission within the household, household members should be given chemoprophylaxis. Chemoprophylaxis in adults includes tetracycline (500 mg orally four
times a day) or doxycycline (a single 300 mg dose). In children, tetracycline (50/mg/kg/day orally in four divided doses) or doxycycline (6 mg/kg orally once a day) may be used for the short course regimen. Alternative prophylactic agents include furazolidone, trimethoprim and sulfonamide (TMP/SMX), or erythromycin.

3. Prevention

3.1. Provide purified water (boil or chlorinate) and sanitary disposal of feces.

3.2. Persons with diarrhea should not prepare food.

3.3. Provide adequate hand washing facilities.

3.4. Cook food, especially fish and shellfish, thoroughly. Refrigerate cooked food (especially grains) immediately.

3.5. Immunization: A killed whole cell vaccine is available, but of little value for epidemic control or management of contacts to cases. Two other oral vaccines are not currently licensed for use in the US.

Management of Cholera in Child Care Centers

Cases of cholera in child care centers are extremely unlikely in the US. In general, children who are not toilet trained and have diarrhea should be excluded from child care settings and evaluated appropriately.

References


CDC. NCID. http://www.cdc.gov/cholera

What is cholera?
Cholera is caused by a bacterium, typically found in intestines or stomach and occasionally causes sepsis.

What are the symptoms of a cholera infection?
The most common symptoms are mild to moderate diarrhea and vomiting. The symptoms generally appear 1 to 3 days after exposure.

How is cholera spread?
Cholera bacteria may be spread by eating contaminated or “dirty” water or food (particularly fish or shellfish). Infected persons can spread the bacteria by not washing their hands after going to the bathroom and then handling food. Direct contact with stool (feces) from an infected person or animal and transferred to the mouth from the hands may also cause infection.

How long are people contagious?
Most persons carry the bacteria for only a few days after illness. A small percentage of infected persons carry the bacteria for a year or longer.

Who gets cholera?
Anyone who has contact with contaminated water or persons can get cholera. However, people with low gastric acid and blood group O are at increased risk.

What treatment is available for people with cholera?
Hydration therapy is recommended for persons with diarrhea. Antimicrobial therapy is recommended for people who are moderately to severely ill. However, administration of appropriate antibiotics within 24 hours of identifying an index case can prevent additional cases.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria is found in stool, children should not go to daycare or school while they have diarrhea and food handlers should be excluded from work. Daycare attendees and workers may return to the daycare setting once they are asymptomatic.

How can I protect myself and my family from getting cholera?
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Purify drinking water.
- Avoid food or water from sources that may be contaminated.
- Always treat raw meats as if they are contaminated and handle accordingly.
- Wrap fresh meats in plastic bags at the market to prevent blood from dripping on other foods.
- Refrigerate foods promptly; minimize time kept at room temperature.
- Immediately washing cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached, particularly when cooking in a microwave.
¿Qué es el cólera?
El cólera es una enfermedad causada por una bacteria que se encuentra normalmente en los intestinos o el estómago y en ocasiones causa sepsis.

¿Cuáles son los síntomas de una infección por cólera?
Los síntomas más comunes son una diarrea leve a moderada y vomito. Los síntomas por lo general aparecen 1 a 3 días luego de la infección.

¿Cómo se transmite el cólera?
La bacteria que causa el cólera puede ser transmitida al comer alimentos o agua contaminados o “sucios” (especialmente pescado o mariscos). Las personas infectadas pueden transmitirles la enfermedad a otros si no se lavan bien las manos luego de usar el baño y luego manipulan alimentos. También puede transmitir la enfermedad si se tiene contacto directo con heces de una persona infectada o un animal infectado y luego se transfiere ese material a la boca de las manos.

¿Por cuánto tiempo son contagiosas las personas infectadas?
La mayoría de las personas solo mantienen la bacteria por unos pocos días luego de pasada su enfermedad. Un pequeño porcentaje de personas infectadas pueden mantener la bacteria por un año o hasta más.

¿Quién puede infectarse de cólera?
Cualquiera que haya tenido contacto con agua contaminada o alguien infectado por cólera puede contraer el cólera. Sin embargo, las personas que tienen bajos niveles de ácidos gástricos y son de grupo sanguíneo tipo O están a mayor riesgo de infectarse.

¿Hay algún tratamiento disponible para las personas infectadas con cólera?
Se recomienda hidratar a las personas con diarrea. Se recomienda tratamiento antimicrobiano sólo para aquellos que tienen una enfermedad moderada a severa. Sin embargo, si se administran antibióticos de manera apropiada dentro de las primeras 24 horas de haberse identificado un caso inicial, se pueden prevenir casos adicionales.

¿Se tiene que mantener a las personas infectadas fuera de la escuela, trabajo o centros de cuidado diario?
Ya que la bacteria se encuentra en las heces, los niños con diarrea no deben ir a la escuela o centro de cuidados diario, lo mismo para individuos que trabajen sirviendo alimentos, no deben ir al trabajo. Los empleados o individuos que atienden un centro de cuidados diario pueden volver a este una vez que sus síntomas hayan subsanado.

¿Cómo puedo protegerme a mí mismo y a mi familia del cólera?
- Lávese las manos frecuentemente con agua y jabón, especialmente luego de usar el baño, cambiar un pañal o antes de preparar y/o ingerir alimentos. (Los geles desinfectantes pueden ser usados en vez si no hay material fecal visible en las manos).
- Filtre o purifique el agua que va a tomar.
- Evite ingerir alimentos o agua de fuentes que puedan estar contaminadas.
- Siempre manipule las carnes crudas como si estuvieran contaminadas.
- Envuelva las carnes frescas en bolsas plásticas en el mercado para prevenir que la sangre gotee sobre otros alimentos.
- Refrigere los alimentos inmediatamente al traerlos a casa; minimice el tiempo que los alimentos pasan a temperatura ambiente.
- Asegúrese de llevar los alimentos a la correcta temperatura de cocción interna, particularmente cuando este cocinándolos en el microondas.
- Lave inmediatamente las tablas para cortar y los mesones donde ha preparado carnes crudas antes de preparar otros alimentos para evitar la cros-contaminación.


**Clostridium difficile Infection**

**Summary**

*Clostridium difficile* (or *C. diff*) is a spore-forming bacterium that can result in asymptomatic colonization or clinical infection. *Clostridium difficile* infection (CDI) causes diarrhea that can range from mild to severe and can even be life-threatening. Signs and symptoms can include watery diarrhea, fever, abdominal pain/tenderness, nausea, and loss of appetite. Serious sequelae, such as pseudomembranous colitis, toxic megacolon, perforations of the colon, sepsis, and death may result from CDI. It is also possible for a person to be colonized with *C. difficile*, and thus not exhibit any clinical signs or symptoms; studies have shown approximately 5% of the general population, and 50% or more of other populations, such as hospitalized patients, residents of long-term care facilities and infants under one year of age, are colonized with *C. difficile*. After treatment for CDI, repeat testing (“test of cure”) is not recommended if signs and symptoms have resolved, as some persons may remain colonized for an undetermined period of time, perhaps weeks to months.

Risk for CDI is increased in persons with recent or prolonged antibiotic exposure, long length of stay in healthcare settings, gastrointestinal surgery and/or manipulation, serious underlying chronic health conditions, immunocompromised status, advanced age, and proton pump inhibitor use. Although CDI remains primarily associated with healthcare exposure, recently infections have been more commonly reported in traditionally ‘low risk’ individuals, such as healthy persons in the community and peripartum women. Changes to the prevalence of CDI may be in part due to the emergence of a more virulent strain of *C. difficile*, known as the restriction enzyme analysis type BI, North American Pulsed Field type 1 (NAP1), or PCR ribotype 027 (BI/NAP1/027). Judicious use of antibiotics, proper contact precautions, and environmental cleaning and disinfection are important prevention strategies for CDI.

**Agent**

*Clostridium difficile* is a Gram-positive, spore-forming, anaerobic bacillus that produces two exotoxins: toxin A and toxin B. The epidemic BI/NAP1/027 strain appears to be more virulent due to increased production of toxins A & B, production of a third toxin called binary toxin, as well as other factors currently being studied. In addition, BI/NAP1/027 is resistant to fluoroquinolones.

**Transmission**

Reservoir:

Humans are the most important reservoir, though it is also found in many domestic and food animal species. Can be isolated from soil; however, any surface, device, or material (e.g., electronic rectal thermometers, commodes, bathing tubs, remote controls) that becomes contaminated with feces may serve as a reservoir for *C. difficile* spores.

Mode of transmission:

*C. difficile* is spread through the fecal-oral route. *C. difficile* spores may also be transferred to patients via the hands of healthcare personnel who have touched a contaminated item or surface.

Period of communicability:

Person-to-person spread occurs from both symptomatic patients and asymptomatic carriers. *C. difficile* spores are highly resistant to desiccation, killing by alcohol and standard EPA-

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registered hospital disinfectants, and can survive in the environment (such as on surfaces or contaminated items) for months or years.

**Clinical Disease**

**Incubation period:**

The incubation period of CDI following medical interventions or organism acquisition has not been clearly defined. Although one study suggested a short incubation period of less than 7 days, others supported a time frame of up to 3 months after completion of antibiotic therapy. Thus, many cases of healthcare-associated CDI may have their onset in the community after hospitalization or medical care.

**Illness:**

Symptomatic *Clostridium difficile* infection causes inflammation of the colon, or colitis. Symptoms may include mild-to-severe watery diarrhea, fever, abdominal pain/tenderness, nausea, and loss of appetite. In severe cases, pseudomembranous colitis, toxic megacolon, perforations of the colon, sepsis, and/or death may occur. However, many studies show that over half of hospital patients and up to 80% of infants under one year of age are asymptomatically colonized. *C. difficile* accounts for 20–30% of antibiotic-associated diarrhea.

**Laboratory Diagnosis**

Most diagnostic testing for *C. difficile* is based on detection of toxin B and/or toxin A in a diarrheal stool specimen or detection of the genes encoding for toxin production. Testing should be performed only on unformed stool unless ileus (i.e., blockage of the intestines caused by a lack of peristalsis) is suspected. Testing for cure and testing on asymptomatic patients is not clinically useful and thus not recommended except for epidemiological studies. Enzyme immunoassay (EIA) tests, which detect toxins A and B, offer rapid turn-around time but have a relatively low sensitivity. A two-step algorithm testing approach, using the more sensitive but nonspecific EIA test for glutamate dehydrogenase (GDH) combined with toxin testing, is often used. A more sensitive and specific approach which has become more widely available is molecular assay testing using nucleic acid amplification tests (NAATs) (e.g., PCR). NAAT may be used as a stand-alone test or as confirmatory testing for discrepant toxin/GDH tests. Stool culture for *C. difficile*, though the most sensitive test available, is labor intensive and has a relatively slow turn-around time and is therefore less clinically useful. *Clostridium difficile* toxin degrades at room temperature and can be undetectable within 2 hours of stool specimen collection. Specimens should be promptly tested and kept refrigerated at 4°C to minimize the occurrence of false-negative results.

**Treatment**

Discontinuation of the potentially precipitating antimicrobial therapy should occur as soon as possible. In approximately 20% of patients, symptomatic CDI will resolve within 2–3 days of discontinuation of antibiotic exposure. Infection can usually be treated with a 10-day course of oral metronidazole, vancomycin, or recently approved fidaxomicin. Metronidazole is usually the drug of choice for initial treatment of mild to moderate cases; oral vancomycin or vancomycin administered via enema plus intravenous metronidazole is indicated for patients with severe disease or for patients who do not respond to metronidazole. Intravenous vancomycin is not effective for *C. difficile* infection.

Relapse occurs in up to 25% of all cases. Tapered or pulse doses of vancomycin are often used for relapsed cases. Metronidazole should not be used for chronic therapy, because of risk for
neurotoxicity. Investigational therapies include fecal transplantation, probiotics, immune globulin therapy, toxin binders, and other antimicrobial agents (tinidazole, nitazoxanide, rifaximin).

**Surveillance**

*Case definition:*

The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) have not developed case definitions for CDI. The New Mexico Department of Health currently conducts two types of CDI surveillance: 1) statewide CDI laboratory surveillance through hospitals that identify cases through positive *C. difficile* toxin assays or positive *C. difficile* molecular assays (e.g., PCR) on stool specimens following National Health Safety Network (NHSN) LabID event protocols; and 2) population-based surveillance in Bernalillo County only through the New Mexico Department of Health Emerging Infections Program (NM EIP) following national EIP surveillance protocols.

*Reporting:*

Report all suspected or confirmed cases of CDI to the Epidemiology and Response Division (ERD). Information needed includes: patient's name, age, date of birth, sex, race, ethnicity, home address, home phone number, occupation, specimen collection date, and health care provider.

**Control Measures**

1. **Case management**
   a. **Isolation:** Standard precautions, contact precautions, and a private room for a hospitalized patient (if feasible) are recommended for the duration of illness. Frequent hand washing, and good personal hygiene should be emphasized. In normal situations, a patient with CDI can be removed from contact isolation when diarrhea resolves; however, some organizations recommend continuing Contact Precautions for at least 48 hours after diarrhea resolves. If there is an outbreak or evidence of ongoing *C. difficile* transmission, consider extending contact isolation until the patient is discharged, or extending isolation until the patient is without diarrhea for 2 days. Test of cure is not recommended. Inter-facility communication should occur upon patient discharge or transfer and should include information about the CDI infection status of the patient.
   b. **Prophylaxis:** Not applicable.

2. **Contact management**
   a. **Isolation:** None required.
   b. **Prophylaxis:** Not applicable.

3. **Prevention**
   a. **Education:** Meticulous hand hygiene, proper handling of contaminated surfaces, disinfection of fomites, and judicious use of antibiotics are the best available methods for controlling CDI. Healthcare providers should use gloves when caring for patients with CDI and should wash hands with soap and water after glove removal. Alcohol-based hand hygiene products do not kill *C. difficile* spores. Thorough cleaning of rooms and bathrooms of patients with *C. difficile* is essential. To ensure proper environmental cleaning and disinfection of any shared medical equipment, facilities should consider using an Environmental Protection Agency (EPA)-registered disinfectant with a sporicidal claim for
environmental surface disinfection and/or 10% hypochlorite solution (e.g., household chlorine bleach). Standard EPA-registered hospital disinfectants are not effective against \textit{C. difficile} spores.

b. Immunization: Not applicable

**Management of CDI in Child Care Centers and Long-Term Care Facilities**

Children with \textit{C. difficile} diarrhea should be excluded from child care settings for the duration of the diarrhea.

Long-term care facility residents with suspect or confirmed CDI should be under appropriate contact precautions, using the least restrictive approach possible that offers adequate protection but does not adversely affect psychosocial well-being. Residents with the ability to maintain adequate personal hygiene should be allowed to participate in group activities when possible, after performing hand hygiene, disinfecting assistive devices (walkers, canes, wheelchairs), and gowning before leaving their room. Residents unable to comply with good hygiene may benefit from a 1:1 caregiver. Guidelines for room assignment strategies can be found in the 2013 APIC Guide to Eliminating \textit{Clostridium difficile} Infections. Healthcare workers should use contact precautions when in the resident’s room and maintain meticulous hand hygiene (see 3. Prevention a. Education above). Medical devices and equipment should be dedicated to single resident use or be disinfected between uses; rectal thermometers should not be used. The CDC NHSN offers a free, voluntary, internet-based surveillance system to allow long-term care facilities to enter data and compare infection rates.

Contact the Epidemiology and Response Division at 505-827-0006 for further recommendations.

**References**


Clinical Practice Guidelines for \textit{Clostridium difficile}. Infection in Adults: 2010 Update by the Society for Healthcare Epidemiology of America (SHEA) and the Infectious Diseases Society of America (IDSA).
**Clostridium difficile INFECTION**

**What is Clostridium difficile infection?**

*Clostridium difficile* is an organism that is frequently found in water, soil and the feces of both, humans and animals. *C. difficile* can live in the gut of healthy human beings without causing disease but, given the right circumstances, such as antibiotic use or use of proton pump inhibitor medications (such as omeprazole, pantoprazole, nexium), *C. difficile* can flourish and cause a severe infection. The infection, known as colitis, is a life-threatening inflammation of the colon that leads to severe, prolonged diarrhea. People with *C. difficile* colitis may become septic and die as a direct consequence of the infection.

**What are the symptoms of C. difficile colitis?**

The most common symptom is severe watery diarrhea, at least three bowel movements per day for two or more days. Other symptoms may include: abdominal pain, fever, nausea and vomiting

**How is C. difficile spread?**

*Clostridium difficile* is shed in feces. Surfaces, devices, or materials (e.g., toilets, bathing tubs, high touch objects) may become contaminated with *Clostridium difficile* spores. *Clostridium difficile* spores are transferred to patients mainly via the hands of those who have touched a contaminated surface or item. *Clostridium difficile* can live for long periods on surfaces. It is resistant to many commonly used cleaners and disinfectants.

**How long are people contagious?**

A person is typically considered infectious while s/he is still having diarrhea. Because the organisms may survive in the environment for months and infect susceptible individuals, it is very important to practice environmental cleaning and disinfection, as well as consistent hand washing.

**Who gets C. difficile colitis?**

Anyone can get *C. difficile* but the risk for disease increases in people with:
- Antibiotic exposure
- Proton pump inhibitors
- Gastrointestinal surgery/manipulation
- Long length of stay in healthcare settings
- A serious underlying illness
- Immunocompromising conditions
- Advanced age

**What treatment is available for people with C. difficile?**

The best first step in the treatment is to discontinue antibiotics that are not absolutely necessary. Treatment options include using vancomycin or fidaxomicin. Other drug combinations may be used for the treatment of relapses, which may occur in up to 25% of people with *C. difficile* associated diarrhea. Stool transplantation has been used with success in specialized centers with sufficient expertise and resources. The number of centers where stool transplants can be safely done is limited. This is not currently considered community standard of care but transferring patients to a medical center with the ability to perform stool transplants may be an option for patients with multiple recurrences. Severely ill patients may require surgical intervention. Surgery may be a life-saving intervention in extremely severe cases.

**Do infected people need to be kept home from school, work or daycare?**

Infected children should stay home from day care until diarrhea has resolved, AND proper hygiene measures can be maintained. Food handlers should be excluded from work until diarrhea has resolved and observe thorough handwashing practices with soap and water as alcohol-based hand rubs are not effective against *C. difficile*. People who provide patient care should consult with their facility’s policy on returning to work.

**How can I protect myself and my family from getting C. difficile?**

- Avoid the use of unnecessary antibiotics and/or proton pump inhibitors
- Alert your health care provider should you develop symptoms, including diarrhea while taking these medications or, within 3 months of having completed a course of antibiotics
- Exercise frequent hand washing
- Always wash your hands with soap and water before eating or putting anything in your mouth
- Alcohol based hand sanitizers do not suffice eradicating the spores. Hand washing is the recommended way of preventing infection.
¿Qué es una infección con Clostridium difficile?
El Clostridium difficile (C. difficile) se encuentra comúnmente en el agua, suelo y heces de humanos y de animales. El C. difficile puede sobrevivir en el intestino de personas saludables sin causar enfermedad, pero dadas las condiciones adecuadas, como el uso de antibióticos, o de medicinas que inhiben las bombas protónicas (tales como el omeprazol, pantoprazol, nexium), puede causar una infección severa. La infección, también conocida como colitis, es una inflamación del colon que puede poner en riesgo la vida y conlleva a diarreas severas y prolongadas. La gente con colitis puede volverse séptica y morir como consecuencia directa de la infección.

¿Cuáles son los síntomas del C. difficile?
El síntoma más común es una diarrea líquida severa, al menos tres movimientos fecales al día por dos o más días. Otros síntomas pueden incluir: dolor abdominal, fiebre, nausea y vomito.

¿Cómo se contagia la enfermedad?
El Clostridium difficile se excreta en las heces. Cualquier superficie, objeto, o material (por ejemplo, pocetas, bañeras, objetos que se tocan mucho) puede ser contaminado con las esporas del Clostridium difficile. Las esporas del Clostridium difficile se transfieren a los pacientes principalmente a través de las manos de aquellos que han tocado una superficie u objeto contaminados. El Clostridium difficile puede sobrevivir por largo tiempo en las superficies de los objetos. Es resistente a muchos de los limpiadores y desinfectantes comúnmente usados.

¿Cuánto tiempo duran las personas siendo contagiosas?
Mientras tenga diarrea. Los organismos pueden sobrevivir en el ambiente por meses e infectar personas susceptibles, por esta razón es importante que se mantengan buenas prácticas de limpieza y desinfección del ambiente, así como lavarse las manos consistentemente.

¿Quién puede infectarse?
Cualquiera puede infectarse con el C. difficile, pero los riesgos de enfermarse aumentan en personas con:
- Exposición a antibióticos
- Uso de inhibidores de bombas protónicas
- Cirugías o manipulaciones gastrointestinales
- Estadías prolongadas en el hospital
- Una condición crónica seria
- Condiciones que los vuelvan inmunodeprimidos
- Edad avanzada

¿Hay algún tratamiento disponible para las personas con C. difficile?
Lo mejor es suspender todo tratamiento con antibiótico que no sea absolutamente necesario. Opciones para tratamiento incluyen vancomicina o fidaxomicina. Otras combinaciones de medicamentos pueden ser usadas para tratar a la gente con recaídas, las cuales pueden ocurrir en hasta 25% de las personas con diarrea por C. difficile. Los trasplantes fecales han sido exitosos en centros especializados que tienen suficientes recursos y experticia. El número de centros especializados donde los trasplantes fecales se pueden realizar de manera segura es limitado. Esto no se considera actualmente como el estándar de cuidado por la comunidad, sin embargo, es una opción para pacientes con varias recaídas. Los pacientes que están gravemente enfermos pueden necesitar de intervenciones quirúrgicas. La cirugía puede ser una intervención que le salve la vida a un caso extremo.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Los niños infectados deben quedarse en casa hasta que la diarrea se haya resuelto y demuestren que pueden mantener medidas higiénicas adecuadas. Las personas que trabajan sirviendo alimentos deben ser excluidos del trabajo hasta que la diarrea se resuelva y demuestren técnicas de lavado de manos adecuadas con agua y jabón. Los desinfectantes de gel no se consideran efectivos contra el C. difficile. Las personas que cuidan de pacientes deben consultar con las políticas de sus instituciones sobre cuando deben regresar al trabajo.

¿Cómo puedo protegerme yo y también proteger a mi familia contra el C. difficile?
- Evite usar antibióticos y/o bombas protónicas de manera innecesaria.
- Digale a su médico si le comienzan síntomas, incluidos diarrea, mientras ha tomado estos medicamentos, o, en los tres meses siguientes después de haber terminado el tratamiento.
- Lávese las manos frecuentemente.
- Siempre lávese bien las manos con agua y jabón antes de comer o poner cualquier cosa en su boca.
- Los desinfectantes de manos en base a alcohol no son suficientes para erradicar las esporas. Lavarse las manos es la manera recomendada de prevenir la infección.
Cryptosporidiosis

Summary

Cryptosporidium species are protozoa that can cause diarrheal illness in humans. The protozoa have been found in a variety of hosts such as mammals, birds, and reptiles. Outbreaks have been associated with contamination of municipal water supplies and swimming pools, as well as petting zoos.

Agent

Cryptosporidium hominis and parvum are the protozoan species associated with human illness.

Transmission

Reservoir:

Humans, cattle, and other domestic animals

Mode of transmission:

Fecal-oral including person-to-person, animal-to-person, waterborne, and foodborne transmission

Period of communicability:

Infectious Cryptosporidium oocysts appear in the stool at onset of symptoms and continue to be excreted in the stool for several weeks after symptoms resolve. Oocysts can remain infective for 2-6 months outside the body in a moist environment.

Clinical Disease

Incubation period:

Usually seven days with a range of 2-14 days.

Illness:

The most common presenting sign is frequent, non-bloody, watery diarrhea. Other signs and symptoms include abdominal cramps, fatigue, vomiting, anorexia, and weight loss. Fever and vomiting can be common in children. In immunocompetent persons, the diarrheal illness is self-limited; the infection can also be asymptomatic. In immunocompromised persons, particularly those with HIV, chronic severe diarrhea and disseminated infection can occur.

Laboratory Diagnosis

Finding oocysts on microscopic examination of fecal smears is diagnostic. Since shedding can be intermittent, at least three stool specimens collected on different days should be examined before a negative result is reported. Enzyme immunodiagnostic assay (EIA), fluorescein-conjugated monoclonal antibody, and polymerase chain reaction (PCR) techniques are diagnostic for illness and useful in detecting oocysts in both stool and environmental samples.

Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a molecular PCR test with a fast turn-around time (approximately 1 hour), and very high sensitivity, it is usually run as a stool GI panel and often result in detection of several conditions.

Treatment
Generally, immunocompetent people need no specific treatment; however, an FDA approved treatment for cryptosporidiosis is available. Nitazoxanide (Alinia®) is marketed in the United States for treating diarrhea caused by Cryptosporidium species and Giardia lamblia. It is licensed for treatment of patients greater than 12 months of age with healthy immune systems. Additional information on nitazoxanide and cryptosporidiosis can be found at http://www.cdc.gov/crypto/treatment.html.

**Surveillance**

Case Definition:

*Laboratory criteria* - Demonstration of Cryptosporidium oocysts in stool; or demonstration of Cryptosporidium in intestinal fluid or small bowel biopsy specimens; or demonstration of Cryptosporidium antigen in stool by a specific immunodiagnostic or polymerase chain reaction (PCR) tests.

*Confirmed* – a case that is laboratory confirmed.

**Reporting:**

Report all suspected or confirmed cases of cryptosporidiosis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

Use the Cryptosporidium Investigation Form to complete your investigation. Investigation information should also be entered into NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio> STEC> Cryptosporidium> Salmonella> Shigella> Campylobacter> Cyclospora> Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. **Case management**
   1.1. **Isolation:**
      1.1.a Exclude symptomatic persons from food handling and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. The person may be allowed to resume his/her usual duties when symptoms have resolved.
      1.1.b For hospitalized patients, enteric precautions in the handling of feces, vomitus, and contaminated clothing and bed linen.
      1.1.c People with a diagnosis of cryptosporidiosis should not use recreational waters for two weeks after symptoms resolve.

   1.2. **Prophylaxis:** Not applicable.

   1.3. **Environmental remediation:** Pools, water parks, and interactive fountains associated with confirmed or probable cases should be hyper chlorinated per ERD recommendations. Report the name of the recreational water venue(s), along with the dates where a confirmed or probable case was swimming or playing, to ERD. This includes any water venue reported by the case from two weeks prior to symptom onset until two weeks after
the last episode of diarrhea. ERD will coordinate hyperchlorination through the appropriate environmental health agency that regulates the recreational water venue.

2. Contact management

2.1. Microscopic examination of feces of household members and other suspected contacts, particularly if symptomatic.

2.2. Prophylaxis: Not applicable.

3. Prevention

3.1. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, caring for someone who is ill with diarrhea, handling an animal or its waste, and before and after handling food).

3.2. People with cryptosporidiosis should avoid participation in recreational water activities, such as swimming, while ill with diarrhea and for 2 weeks after symptoms have completely resolved.

3.3. General guidelines for preventing foodborne illness include:

- Thoroughly cook raw food from animal sources.
- Wash raw vegetables.
- Avoid unpasteurized dairy products.
- Wash hands, knives, and cutting boards after handling uncooked foods.

3.4. Immunization: Not applicable.

Management of Cryptosporidiosis in Child Care Centers

- Exclude infected children and staff from child care facilities until diarrhea stops.
- Per child care licensing regulations, a center should notify parents or guardians in writing of a case of cryptosporidiosis in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 7 for a template of a notification letter.

Control Measures for the Child Care Setting During an Outbreak of Cryptosporidiosis

Cryptosporidiosis is a gastrointestinal illness caused by the parasite Cryptosporidium. This disease is a common cause of diarrhea in children, especially in child care settings. The hallmark symptom of cryptosporidiosis is watery diarrhea, which might be accompanied by stomach ache, nausea and vomiting, fever, and a general sick feeling. Healthy people who contract cryptosporidiosis almost always get better without any treatment, but treatment is available by prescription. An unusual feature of cryptosporidiosis is that some people seem to get better only to have the diarrhea come back in a few days. Signs and symptoms can come and go for up to 30 days, but usually subside in 1-2 weeks. Cryptosporidiosis can cause severe illness in persons with compromised immune systems, such as those with human immunodeficiency virus (HIV) infection or those taking drugs that suppress the immune system.

Because Cryptosporidium is in feces, anything that gets contaminated by feces can potentially spread the parasite. As a result, the parasite can be spread directly from person to person, through contact with contaminated objects (e.g., toys), or by swallowing contaminated food or water (drinking and recreational). Cryptosporidiosis outbreaks in child care settings are most
common during late summer/early fall (August/September) but might occur at any time. The spread of cryptosporidiosis is greatest among young children who are not toilet trained and their caregivers (those who change diapers).

*Cryptosporidium* is resistant to chlorine disinfection, so it is tougher to kill than most disease-causing organisms. The usual disinfectants, including most commonly used bleach solutions, have little effect on the *Cryptosporidium* parasite. An application of either hydrogen peroxide or ammonia seems to work best. Hydrogen peroxide is probably the best choice in the child care setting because ammonia has a strong odor and produces hazardous gas when mixed with bleach or other chlorinated solutions.

If an outbreak of cryptosporidiosis occurs in the child-care setting:

1. Educate staff and parents.
   a) Inform all staff about the ongoing outbreak, the signs and symptoms of cryptosporidiosis, how it is transmitted, and control measures to be followed.
   b) Inform parents about the ongoing outbreak, the signs and symptoms of cryptosporidiosis, how it is transmitted, outbreak control policies, and needed changes in hygiene and cleanliness.
   c) Notify parents of children who have been in direct contact with a child or an adult caregiver with diarrhea. Parents should contact the child's health care provider if their child develops diarrhea.
   d) Inform parents of children and staff about *Cryptosporidium*'s potential to cause severe disease in immunocompromised persons. Immunocompromised persons should consult their health care provider for further guidance.

2. Exclude any child with diarrhea from the child care setting until the diarrhea has stopped.
   a) Children who are infected with *Cryptosporidium* but who do not have diarrhea may be allowed to return.
   b) Recently returning children can be grouped together in one classroom to minimize exposure to uninfected children.
   c) Move adults with diarrhea to jobs that minimize opportunities for spreading disease (e.g., administrative work instead of food preparation.)

3. Terminate all water play or swimming activities (e.g., water tables, inflatable or rigid temporary swimming pools, public pool visits). This water can become contaminated and facilitate the spread of infections.

4. Practice good hygiene. Note: The measures outlined should be routine but are especially important during outbreaks.
   a) Enforce frequent hand washing and good hand washing technique for all children and adults.
      
      Note: *Cryptosporidium* is not killed by alcohol gels and hand sanitizers, so these are of little use in controlling an outbreak.
   b) Use disposable towels.
   c) Good hand washing means:
   d) Wet your hands with clean running water and apply soap.
e) Rub hands together to a lather and scrub all surfaces.
f) Continue rubbing hands for 20 seconds (imagine singing “Happy Birthday” twice.)
g) Rinse hands well with water.
h) Dry hands with paper towels or an air dryer. If possible, use a paper towel to turn off the faucet.
   For children:
   ▪ Observe hand washing or assist when needed. Wash children’s hands when they arrive at the child care facility, after they use the toilet, after having their diapers changed, and before eating snacks or meals.
   For adults:
   ▪ Wash hands after using the toilet, after helping a child use the toilet, after diapering a child, and before preparing or serving food. (Note: Where staffing permits, people who change diapers should not prepare or serve food).

5. Improve diaper changing practice.
   a. Separate diaper changing areas from children’s play and food preparation areas.
   b. Use disposable gloves and change them after each diaper change.
   c. Use disposable paper over the diaper changing surfaces and change it after each diaper change.
   d. Ensure children wear clothing over their diapers to reduce the opportunity for leakage.
   e. Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.
   f. Wash hands: both yours and the child’s hands.

6. Disinfect surfaces and objects
   a. No disinfectant is guaranteed to be completely effective against *Cryptosporidium*. However, hydrogen peroxide is usually effective.
      ▪ Instead of a bleach solution, use a 3% (99% kill rate) or, if available, 6% (99.9% kill rate) concentration of hydrogen peroxide to soak contaminated surfaces for 20 minutes.
      ▪ Ammonia can also be used (5% solution for 18 hours) but it has a strong odor and, if accidentally mixed with bleach or other chlorine containing solutions, produces hazardous chlorine gas.
b. Disinfect bathrooms, diaper areas, and food preparation surfaces daily.

c. Disinfect toys, tabletops, and high chairs more frequently than usual (at least twice daily.)
   ▪ Dishwasher-safe toys can be disinfected in a commercial dishwasher that has a dry cycle or a final rinse that exceeds 113°F for 20 minutes or 122°F for five minutes or 162°F for one minute. Cloth toys may be washed and heat-dried on the highest clothes dryer heat setting for 30 minutes.

d. These are not routine measures, but may be necessary if an outbreak occurs, which is defined as two or more cases in the same child care group.

7. Notify ERD about an excessive level of diarrhea or any Cryptosporidium infections in a daycare. Cryptosporidium is a reportable disease.

References


What is cryptosporidiosis?
Cryptosporidiosis is a disease caused by a protozoan organism called *Cryptosporidium*.

What are the symptoms of cryptosporidiosis?
Illness usually begins about 2 to 14 days after being exposed to the organism. Symptoms include watery diarrhea and stomach cramping. Some persons vomit and have a low-grade fever. Symptoms may come and go and last for about two weeks, but sometimes continue for up to a month.

How is cryptosporidiosis spread?
Persons or animals become infected by swallowing the organism. This may happen when a person or animal drinks water or eats food “dirtied” or contaminated with infected stool (feces) material. *Cryptosporidium* may also be spread if a person touches objects contaminated with the stool and gets the organism on their hands. Their unwashed hands can then transfer the organisms to their mouth. Some people have become sick after swimming in public pools contaminated with stools from infected persons.

How long are people contagious?
In most cases, stools no longer contain the organism after two weeks.

Who gets cryptosporidiosis?
Anyone, but it may be more common in persons with weakened immune systems.

What treatment is available for people with cryptosporidiosis?
Treatment with a drug called nitazoxanide (Alinia®) is available for people over one year of age that have a healthy immune system. Persons with diarrhea should drink plenty of fluids. People with weakened immune systems should see their doctor.

Do infected people need to be kept home from school, work or daycare?
Since *Cryptosporidium* is passed in the stool, children and staff in daycare centers, health care workers, or people who handle food should not go to school or work while they have diarrhea. After diarrhea ends, persons may return to work or school and they should continue to observe hand washing practices.

How can I protect myself and my family from getting cryptosporidiosis?
You can decrease your chance of coming in contact with *Cryptosporidium* with these practices:

- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper, caring for someone who is ill with diarrhea, handling an animal or its waste, and before preparing and/or eating meals.
- Promptly clean contaminated surfaces with 3% hydrogen peroxide.
- Carefully dispose of sewage wastes so as not to contaminate surface or groundwater.
- Avoid food or water from sources that may be contaminated.
- Avoid accidentally swallowing water from lakes, rivers or swimming pools.
¿Qué es la criptosporidiasis? La criptosporidiasis es una enfermedad causada por un organismo protozoario que se llama Cryptosporidium.

¿Cuáles son los síntomas de la criptosporidiasis?
La enfermedad normalmente comienza entre 2 y 14 días después de haber estado expuesto al organismo. Los síntomas incluyen diarrea acuosa y retorcijones. Algunas personas tienen vómitos y fiebre baja. Los síntomas pueden ir y venir, y seguir por dos semanas, pero a veces pueden continuar por un mes.

¿Cómo se transmite la criptosporidiasis?
Las personas o los animales pueden contraer la infección si se tragan este organismo. Esto puede hacerse cuando las personas o los animales toman agua o alimentos que están contaminados o “ensuciados” con materia fecal infectada. El Cryptosporidium tambien puede transmitirse si la persona toca las heces o los objetos contaminados por éstas y, así, pasan el germen a sus manos. Si no se lavan las manos, pueden transferir los organismos de la mano a la boca. Algunas personas se han enfermado después de nadar en piscinas públicas donde el agua estaba contaminada con heces de personas infectadas.

¿Por cuánto tiempo puede alguien con criptosporidiasis contagiar a otros?
En la mayoría de los casos, el organismo deja de estar presente en las heces infectada después de 2 semanas.

¿Quién puede contraer la criptosporidiasis?
Cualquier persona puede contraerla, pero es más común en personas que tienen su sistema inmunológico debilitado.

¿Cómo se trata la criptosporidiasis?
Hay una droga disponible para tratamiento de la infección en personas más de un año que tienen sistemas de inmunidad saludables. La droga se llama nitazoxanide (Alinia®). Pregunta su doctor sobre esta droga. Si se tiene diarrea, hay que tomar muchos líquidos. Las personas que tienen su sistema inmunológico debilitado, sobre todo, deben ir al médico si piensan que pueden tener esta enfermedad.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Como el Cryptosporidium está presente en las heces, los niños y los que trabajan en guarderías, clínicas de salud o aquellos que trabajan manipulando alimentos deben quedarse en casa y no ir a la escuela o al trabajo mientras tengan diarrea. Una vez que la diarrea desaparece, pueden regresar al trabajo o a la escuela, pero deben tener especial cuidado y lavarse las manos después de usar el baño.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la criptosporidiasis?
Para disminuir sus posibilidades de entrar en contacto con el Cryptosporidium, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales, cuidar a alguien que este enfermo con diarrea, manipular animales o sus excrementos y antes de preparar o comer alimentos. Desinfecte pronto las superficies contaminadas con 3% agua oxigenada.
- Elimine desechos residuales o aguas negras con cuidado de no contaminar otras fuentes de agua (como agua de ríos, pozos, etc.).
- Evite agua o comida que puedan provenir de fuentes contaminadas.
- Evite tragar de forma accidental agua de lagos, ríos, piscinas o albercas.
Cyclosporiasis

Summary
Cyclosporiasis is a parasitic intestinal infection that causes profuse, non-bloody, watery diarrhea. Anorexia, nausea, vomiting, abdominal bloating or cramping, and weight loss may occur. Transmission is primarily waterborne through drinking or swimming in contaminated water. Foodborne outbreaks do occur and those in the US and Canada have been associated with various types of imported fresh produce, including raspberries, basil, snow peas, and mesclun lettuce. Diagnosis is made by identification of oocysts in stool. Effective antibiotic treatment is available.

Agent
*Cyclospora cayatanensis* is a protozoan intestinal parasite.

Transmission
Reservoir:
- Contaminated water; there are no known other animal reservoirs.

Mode of transmission:
- Mainly waterborne, through drinking or swimming in contaminated water. Outbreaks have been reported from ingestion of fresh berries and other fresh produce.

Period of communicability:
- Unknown, person to person transmission has not been documented.

Clinical Disease
Incubation period:
- Median seven days; range 1-14 days.

Illness:
- Low-grade fever, which can occur in 50% of cases (mainly children), and non-specific flu-like symptoms before or with onset of profuse, watery non-bloody diarrhea. Anorexia, nausea, vomiting, abdominal bloating or cramping, and weight loss may occur. Illness may last for weeks; relapse may occur even in healthy people with normal immune function. Persons with impaired immune function may have more prolonged signs and symptoms.

Laboratory Diagnosis
- Fecal parasite examination; 8-10 micron diameter wrinkled oocysts visible by safranin or modified acid-fast stain; oocysts are autofluorescent under ultraviolet illumination.
- Deoxyribonucleic acid (DNA)-based assays (e.g., PCR) are available through CDC and other reference laboratories.
- Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a molecular PCR test with a fast turnaround time (approximately 1 hour), however, the PCR is run as a stool GI panel, that is highly sensitive and often result in detection of several conditions.

Treatment
Trimethoprim/sulfamethoxazole (TMP/SMX) in standard dosage for seven to ten days is effective therapy. People with HIV may need higher doses and long-term maintenance therapy.

**Surveillance**

**Case Definition:**

*Laboratory criteria* - Requires detection of *Cyclospora* either by: oocysts in stool by microscopic examination; or oocysts in intestinal fluid or small bowel biopsy specimens; or demonstration of sporulation; or identification of DNA (by PCR) in stool, duodenal/jejunal aspirates or small bowel biopsy specimens.

*Confirmed* – a laboratory confirmed case that is either symptomatic or asymptomatic.

*Probable* – a case that has been clinically diagnosed and is epi linked to a confirmed case.

**Reporting:**

Report all confirmed cases of cyclosporiasis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

Complete the CDC Cyclosporiasis Surveillance Report form and mail to the Epidemiology and Response Division P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: *Vibrio>* STEC> *Cryptosporidium>* Salmonella> *Shigella>* Campylobacter> *Cyclospora>* Giardia.

1. **Case management**

1.1. Isolation: No isolation is required for the general population, however, in child care centers, children and staff should be excluded until diarrhea stops; in hospitalized patients, contact precautions are recommended for diapered or incontinent children.

1.2. Prophylaxis: Not applicable.

2. **Contact management**

2.1. Isolation: None required.

2.2. Prophylaxis: Not applicable.

3. **Prevention**

3.1. Immunization: Not applicable.

3.2. Avoiding food or water that may be contaminated with feces, and thoroughly washing fresh produce before eating, are the best ways to prevent cyclosporiasis.

**References**

What is cyclosporiasis?
Cyclosporiasis is a disease caused by a coccidian protozoan called *Cyclospora cayetanensis*.

What are the symptoms of cyclosporiasis?
Illness usually begins about 2 to 14 days after being exposed to the organism. Symptoms include watery diarrhea, stomach cramping, nausea, and vomiting. Symptoms may come and go and last for about two weeks, but sometimes continue for up to a month.

How is cyclosporiasis spread?
Persons or animals become infected by swallowing the organism. This may happen when a person or animal drinks water or eats food “dirtied” or contaminated with infected stool (feces) material, usually imported fresh produce. Cyclosporiasis may also be spread if a person touches objects contaminated with the stool and gets the organism on their hands. Their unwashed hands can then transfer the organisms to their mouth.

How long are people contagious?
In most cases, stools no longer contain the organism after two weeks.

Who gets cyclosporiasis?
Anyone, but it may be more common in persons with weakened immune systems.

What treatment is available for people with cyclosporiasis?
Treatment with a drug called trimethoprim/sulfamethoxazole (TMP/SMX). Persons with diarrhea should drink plenty of fluids. People with weakened immune systems should see their doctor.

Do infected people need to be kept home from school, work or daycare?
Since *Cyclospora* is passed in the stool, children and staff in daycare centers, health care workers, or people who handle food should not go to school or work while they have diarrhea. After diarrhea ends, persons may return to work or school and they should continue to observe hand washing practices.

How can I protect myself and my family from getting cyclosporiasis?
You can decrease your chance of coming in contact with cyclosporiasis with these practices:
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper and before preparing and/or eating meals.
- Avoid food or water from sources that may be contaminated.
- Wash fresh produce thoroughly before consuming
¿Qué es la cyclosporiasis?

La cyclosporiasis es una enfermedad causada por un protozoo coccidiano llamado Cyclospora cayetanensis.

¿Cuáles son los síntomas de una infección por cyclosporiasis?

La enfermedad usualmente comienza de 2 a 14 días luego de haberse infectado con el organismo. Los síntomas incluyen diarrea, dolores estomacales, nausea y vomito. Los síntomas van y vienen y pueden durar cerca de dos semanas, pero en algunos casos pueden continuar por un mes.

¿Cómo se transmite el cyclosporiasis?

Las personas o los animales suelen infectarse al tragar el organismo. Esto puede pasar cuando una persona o un animal toman agua o ingieren algún alimento contaminado o "sucio" con material fecal infectado, usualmente en vegetales importados. La cyclosporiasis también se puede transmitir si una persona toca un objeto contaminado con heces y se contamina las manos con el organismo. Luego, las manos contaminadas pueden transferir el organismo a la boca.

¿Por cuánto tiempo son contagiosas las personas infectadas?

En la mayoría de los casos el organismo no se encuentra en las heces luego de dos semanas.

¿Quién puede infectarse de cyclosporiasis?

Cualquiera, pero puede ser más común en personas con el sistema inmune debilitado.

¿Hay algún tratamiento disponible para las personas infectadas con cyclosporiasis?

El tratamiento se hace con un medicamento llamado Trimethoprim/sulfamethoxazole (TMP/SMX). Aquellas personas con diarrea deben de tomar bastante agua o fluidos. Los individuos con el sistema inmune debilitado deben de verse con su médico.

¿Se tiene que mantener a las personas infectadas fuera de la escuela, trabajo o centros de cuidado diario?

Ya que la cyclospora se transmite por las heces, los niños con diarrea no deben ir a la escuela o centro de cuidados diario, lo mismo para individuos que trabajen sirviendo alimentos, no deben ir al trabajo. Una vez que la diarrea se ha acabado, las personas pueden volver al trabajo o la escuela y deben continuar lavándose las manos con frecuencia.

¿Cómo puedo protegerme a mí mismo y a mi familia del cyclosporiasis?

Usted puede disminuir su chance de infectarse con cyclosporiasis si sigue estos consejos:

- Lávese las manos frecuentemente con agua y jabón, especialmente luego de usar el baño, cambiar un pañal o antes de preparar y/o ingerir alimentos.
- Evite ingerir alimentos o agua de fuentes que puedan estar contaminadas.
- Lave las frutas y verduras frescas muy bien antes de consumirlos.
Diphtheria

Summary

In the post-vaccine era, infection and toxicosis due to *Corynebacterium diphtheriae* are rare. In the past decade, there were less than five cases of diphtheria in the United States reported to CDC, however the disease continues to be found around the world. Respiratory diphtheria presents as a sore throat with low-grade fever and an adherent membrane of the tonsils, pharynx, or nose. Neck swelling is usually present in severe disease. Myocarditis, polyneuritis, and airway obstruction are common complications of respiratory diphtheria; death occurs in 5-10% of respiratory cases. Cutaneous diphtheria presents as infected skin lesions which lack a characteristic appearance. Consider diphtheria in patients with wounds who have recently traveled internationally. Complications and deaths are much less frequent in cutaneous diphtheria. Travel-related exposures should be considered for any suspect or confirmed report of diphtheria.

Disease control requires maintenance of immunization levels and prompt isolation until cases and contacts are culture negative.

Agent

*Corynebacterium diphtheriae* is a gram-positive pleomorphic bacillus.

Transmission

Reservoir:

Humans.

Mode of transmission:

Person to person by contact with infected respiratory secretions, skin lesions or rarely fomites.

Period of communicability:

Untreated: 2-6 weeks; rare carrier may shed the organism for six months or longer. Effective antibiotic therapy promptly terminates shedding.

Clinical Disease

Incubation period:

Usually 2-5 days (range, 1-10 days).

Illness:

Clinical disease ranges from localized ulcerative skin lesions to toxin-mediated membranous upper respiratory lesions (most commonly tonsillo-pharyngitis). Gray membrane adheres tightly to underlying tissue, and may involve the nose, nasopharynx, throat, tonsils, larynx, trachea, conjunctiva, ear, or less commonly other mucous membranes such as the vagina. Fever is usually low grade. There is associated tender regional (cervical) lymphadenopathy and in severe cases, marked swelling of neck. Involvement of palate or uvula suggests diphtheria, as streptococcal tonsillo-pharyngitis and infectious mononucleosis usually do not affect uvula or palate. Non-toxigenic strains may cause endocarditis or skin lesions. Myocarditis causes heart block and cardiac failure. Exposed persons may become carriers.
Laboratory Diagnosis

Specimen for culture should be collected from nose, throat, or any mucosal or cutaneous lesion. Material taken from the membrane (plaque) or just below the membrane should be submitted for culture. Notify laboratory of suspicion of diphtheria because special media are required. When *Corynebacterium diphtheriae* are recovered, the strain should be tested for toxigenicity. All isolates should be forwarded to CDC. CDC performs *diphtheria* confirmatory tests by polymerase chain reaction (PCR) which detects the regulatory gene for toxin production (dtxR) and the diphtheria toxin gene (tox) on nonviable organism. PCR detection does not demonstrate production of diphtheria toxin. A positive PCR test in the absence of a positive culture does not meet laboratory criteria for classifying a case as confirmed for diphtheria.

Serological testing is not very common and only a handful of laboratories can perform this test. Antibody tests can be used to assess the probability of diagnosis.

The Elek test is done to determine whether the organisms produce diphtheria toxin and biotyping is conducted to determine biotype (intermedius, belfanti, mitis, or gravis).

Treatment

Treatment should occur based on the clinical diagnosis and before culture confirmation.

Antitoxin:

Diphtheria Antitoxin (DAT), an equine antitoxin, is not licensed by the FDA for use in the U.S. CDC is authorized to distribute DAT to physicians as an Investigational New Drug (IND). Patients who have probable or confirmed respiratory diphtheria are eligible to receive DAT.

- Prophylactic Use:
  DAT is used prophylactically only under exceptional circumstances involving known or suspected exposure to toxigenic *Corynebacterium diphtheriae*.

- Requesting DAT:
  U.S. physicians caring for patients with suspected respiratory diphtheria can obtain DAT by contacting the CDC’s Emergency Operations Center at 770-488-7100.

Route:

The intravenous (IV) route is the preferred route of administration, especially in severe cases. The antitoxin should be mixed in 250 – 500 mL of normal saline and administered over 2-4 hours. The antitoxin may be given intramuscularly (IM) in mild or moderate cases.

Temperature:

Antitoxin should be warmed to 32 - 34°C (90 - 95°F) before injection. Warming above the recommended temperature should be carefully avoided because the DAT proteins will denature.

Dosage:

- Perform sensitivity tests, and desensitization using a scratch test before intravenous administration.
• The dose of antitoxin depends on the site and size of the diphtheria membrane, duration of illness and degree of toxic effects (presence of soft diffuse cervical lymphadenitis suggests moderate to severe toxin absorption.

• Give the entire treatment dose of antitoxin intravenously (or intramuscularly) in a single administration (except for series of injections needed for desensitization). When using the intravenous route, the antitoxin should be diluted in physiologic saline and administered slowly over several hours, closely monitoring for anaphylaxis.

• The recommended DAT treatment dosage ranges are:
  o Pharyngeal or laryngeal disease of 48 hours duration: 20,000 to 40,000 units.
  o Nasopharyngeal disease: 40,000 to 60,000 units.
  o Systemic disease of three or more days' duration, or any patient with diffuse swelling of the neck: 80,000 to 100,000 units.
  o Skin lesions only: 20,000 to 40,000 units (for cases where treatment is indicated).

• Give children the same dose as adults.

• Repeated doses of DAT after an appropriate initial dose are not recommended and may increase the risk of adverse reaction.

• Appropriate antimicrobial agents in full therapeutic dosages should be started.
  o ERD will coordinate obtaining antitoxin from the CDC National Immunization Program (404-639-3158) or CDC Emergency Operations Center (770-488-7100).
  o Use of immunoglobulin (IG) instead of antitoxin is not approved.
  o Antibiotic therapy is required to eradicate the organism and stop transmission; usual treatment is with penicillin or erythromycin.
  o Unimmunized or incompletely immunized carriers should complete the series for active immunization. Carriers should also be given antibiotic therapy with either penicillin or erythromycin.

Antibiotics:
Erythromycin and penicillin are administered as a 14-day course and are required to stop toxin production and clear C. diphtheria

Vaccination:
Patients should be immunized during convalescence as diphtheria disease does not always confer immunity.

Cutaneous Diphtheria – Lesions should be thoroughly cleaned with soap and water and antibiotics administered for 10 days as recommended.

**Surveillance**

**Case Definition:**
**Confirmed**
An upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx; and any of the following:
• Isolation of Corynebacterium *diphtheriae* from the nose or throat; or
• Histopathologic diagnosis of diphtheria; or
• Epidemiologic linkage to a laboratory-confirmed case of diphtheria

**Probable**

In the absence of a more likely diagnosis, an upper respiratory tract illness with:

• An adherent membrane of the nose, pharynx, tonsils, or larynx; and
• Absence of laboratory confirmation; and
• Lack of epidemiologic linkage to a laboratory-confirmed case of diphtheria.

**Reporting:**

Report all suspected or confirmed cases of diphtheria immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

Complete the CDC Diphtheria Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

1. **Case management**

   1.1. **Isolation:**

   1.1.a For respiratory diphtheria, droplet precaution in addition to standard precautions should be instituted (Appendix 4) until two sets of cultures from both nose and throat taken at least 24 hours apart and at least 24 hours after completion of antibiotic therapy are negative; or until completion of 14 days of appropriate antibiotic therapy.

   1.1.b For cutaneous diphtheria, contact isolation (Appendix 4) until two cutaneous cultures taken at least 24 hours apart and at least 24 hours after completion of antibiotic therapy are negative; or until completion of 14 days of appropriate antibiotic therapy.

   1.2. **Prophylaxis:** Not applicable.

2. **Contact management**

   2.1. **Isolation:** Contacts who are food handlers and adults who have contact with incompletely immunized children are excluded until nose and throat cultures are negative for *C. diphtheriae* and they have received appropriate antibiotic treatment (see 2.2 below).

   2.2. **Prophylaxis:**

   2.2.a Close contacts should have cultures of nose and throat taken and be kept under surveillance for seven days.
2.2.b A single dose of benzathine penicillin or 7-10 days of erythromycin should be given to all household contacts, regardless of immunization status.

2.2.c Contacts who cannot be kept under surveillance should receive penicillin G benzathine but not erythromycin due to better medication adherence.

3. Prevention

3.1. Immunization: Active immunization with diphtheria toxoid (combined with tetanus toxoid and acellular pertussis, DTaP) given at 2, 4 and 6 months of age, booster at 12-18 months and before school entry. Reduced diphtheria toxoid dose (Td or Tdap) is given every 10 years to persons over 7 years old.

Circulation appears to continue in some settings even in populations with >80% childhood immunization rates. An asymptomatic carrier state exists even among immune individuals. Immunity wanes over time. Decennial booster doses are required to maintain protective antibody levels. Large populations of adults are susceptible to diphtheria in developed countries and susceptibility appears to be increasing in developing countries. A large outbreak of diphtheria occurred during 1990-1995 in states of the former Soviet Union likely due to waning immunity. Mass vaccination controlled the outbreak.

Management of Diphtheria in Child Care Centers

A case of diphtheria in a child care center should be managed in conjunction with ERD. Isolation criteria apply to child care as noted above. Immunization records of children in school and daycare should be reviewed.

References


CDC. http://www.cdc.gov/vaccines/vpd-vac/diphtheria/

DIPHTHERIA

What is diphtheria?
Diphtheria is a disease caused by bacteria. These bacteria release toxins that generally affect the tonsils, throat or nose. The bacteria can also affect skin. This disease is rare in the United States.

What are the symptoms of diphtheria?
Symptoms usually appear 2 to 7 days after exposure. There are two types of diphtheria. One type is called respiratory diphtheria and affects the nose and throat. Symptoms may include sore throat, low-grade fever and neck swelling. A gray membrane may form across the throat. The second kind, cutaneous diphtheria, involves the skin. Skin lesions may be painful, swollen and reddened. Sometimes, a person with diphtheria has no symptoms.

How is diphtheria spread?
Diphtheria is spread from person to person through close contact with discharges from an infected person's nose, throat, eyes, and skin.

How long are people contagious?
Persons are no longer contagious 24 hours after the person has completed appropriate antibiotics. Untreated people who are infected with the diphtheria bacteria are usually contagious for 1 - 4 weeks and seldom more than six months.

Who gets diphtheria?
Diphtheria is a rare disease. It is most likely to happen when unvaccinated persons live in crowded conditions.

What treatment is available for people with diphtheria?
A health care provider may decide to use antitoxin in some situations. Antibiotics, such as penicillin and erythromycin, may be prescribed for the treatment of diphtheria.

Do infected people need to be kept home from school, work or daycare?
Persons with diphtheria will need to be kept home until public health recommendations approve their return to work, school or daycare.

How can I protect myself and my family from getting diphtheria?
- Keep up to date on immunizations. Diphtheria toxoid is usually combined with tetanus toxoid and pertussis vaccine to form a triple vaccine known as DTaP. This vaccine should be given at 2, 4, 6, and 12 - 15 months of age, and between 4 and 6 years of age. Everyone should also receive a combination of tetanus and diphtheria toxoids (Td) or tetanus, diphtheria and pertussis toxoids (Tdap) every 10 years to maintain immunity.
- Anyone who has close contact with a person with diphtheria will be tested for the disease, given an antibiotic and an immunization. Close contacts may also be kept out of school, daycare or work until it is clear that they are free of the disease.
¿Qué es la difteria?
La difteria es una enfermedad que está causada por una bacteria. Estas bacterias liberan una toxina (como un veneno) que generalmente afecta a las amígdalas, la garganta o la nariz. La bacteria también puede afectar a la piel. Esta enfermedad es rara en los Estados Unidos.

¿Cuáles son los síntomas de la difteria?
Los síntomas normalmente aparecen entre 2 y 7 días después de haber estado expuesto. Hay dos tipos de difteria. La difteria respiratoria afecta a la nariz y la garganta. Los síntomas pueden incluir dolor de garganta, fiebre baja e inflamación del cuello. Puede ser que aparezcan unas membranas de color gris en la zona de la garganta. El segundo tipo es la difteria cutánea y afecta a la piel. Las lesiones que produce en la piel pueden ser dolorosas y estar inflamadas y enrojecidas. A veces, alguien con difteria puede no presentar ningún síntoma.

¿Cómo se transmite difteria?
La difteria se contagia de persona a persona por contacto cercano con las secreciones que proceden de la nariz, la garganta, la piel y los ojos de la persona infectada.

¿Por cuánto tiempo puede alguien con difteria contagiar a otros?
La persona con difteria deja de ser contagiosa 24 horas después de haber completado todos los antibióticos necesarios. Si una persona no se trata y tiene difteria, puede contagiar a otros por un periodo de una a cuatro semanas. En raras ocasiones, puede seguir en riesgo de contagiar a otros durante más de seis meses.

¿Quién puede contraer la difteria?
La difteria es una enfermedad muy rara. Es más posible que se dé en personas que no están vacunadas y que viven hacinadas (un número excesivo de personas viven en un mismo lugar).

¿Cómo se trata la difteria?
Los médicos pueden decidir usar la antitoxina (sustancia contra el veneno) en algunas situaciones. Se pueden recetar algunos antibióticos, como la penicilina y la eritromicina, para tratar la difteria.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas que tienen difteria necesitan quedarse en casa hasta que las autoridades de salud pública aprueben su regreso al trabajo, a la escuela o a la guardería.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la difteria?
- Mantenga al corriente sus vacunas. Normalmente la vacuna de la difteria se combina con el tétanos y la tos ferina, y forman una única vacuna que se conoce como la triple viral (DTaP por sus siglas en inglés). Esta vacuna se debe administrar a la edad de 2, 4, 6 y 15 meses, y más tarde entre los 4 y 6 años. También todos deben recibir una vacuna de refuerzo combinada contra el tétanos y la difteria (Td o Tdap) cada 10 años para mantener la inmunidad.
- Cualquier persona que haya tenido contacto con alguien que tenga difteria, deberá hacerse una prueba, recibir antibióticos y la vacuna. Estas personas no deben ir tampoco a la escuela, a la guardería o al trabajo hasta que se haya determinado que no tienen la enfermedad.
**E. coli** Shiga Toxin-producing (STEC) Infections

**Summary**

Shiga toxin-producing *E. coli* (STEC) are diarrhea-causing strains of a group of bacteria called *Escherichia coli*. *E. coli* O157:H7 is the most well-known type of STEC, but there are many other types that can cause illness in humans. While STEC infection has traditionally been associated with animal products, outbreaks associated with produce have become more common.

**Agent**

There are many different types of *E. coli*, only some of which are pathogenic to humans. One type of pathogenic *E. coli*, Enterohemorrhagic *E. coli* (EHEC), produces toxins called Shiga toxins (similar to the toxin produced by *Shigella*) and for this reason these *E. coli* are commonly referred to as Shiga toxin-producing *E. coli* (STEC). In addition to *E. coli* O157, there are many other types that can cause illness, such as *E. coli* O26, *E. coli* O45, *E. coli* O103, *E. coli* O111, *E. coli* O121, and *E. coli* O145.

**Transmission**

Reservoir:

Cattle are the most important reservoir of STEC. Humans may also serve as a reservoir for person-to-person transmission. Other animals including deer, sheep, and goats may also carry STEC.

Mode of transmission:

 Occurs mainly by ingestion of contaminated food; most often due to inadequately cooked beef (especially ground beef), but also raw milk and fruit or vegetables contaminated with cattle or other animal feces. Transmission also occurs directly from person to person via fecal-oral routes, such as in families, restaurants, child care centers, and custodial institutions. Waterborne transmission has also been documented in swimmers in lakes and rivers and outbreaks have implicated petting zoos.

Period of communicability:

For the duration of excretion of the pathogen, this is typically for a week or less in adults but is three weeks in one third of children. Prolonged carriage is uncommon.

**Clinical Disease**

Incubation period:

Variable; for O157:H7 usually 3-4 days with a range of 1-8 days.

Illness:

STEC strains cause diarrhea, hemorrhagic colitis, hemolytic-uremic syndrome (HUS) which causes destruction of red blood cells and possible kidney failure and post diarrheal thrombotic thrombocytopenic purpura (TTP). Illness caused by STEC often begins as non-bloody diarrhea but usually progresses to diarrhea with visible or occult blood. Severe abdominal pain is typical; fever occurs in less than one third of cases. Hemorrhagic colitis is the most severe intestinal infection caused by *E. coli*. 
Laboratory Diagnosis

- *E. coli* O157:H7 can be identified presumptively or specifically by appropriate stool cultures. Clinical laboratories can screen for *E. coli* O157:H7 by using MacConkey agar base with sorbitol substituted for lactose. Approximately 90% of human intestinal *E. coli* strains rapidly ferment sorbitol, whereas *E. coli* O157:H7 strains do not. These sorbitol-negative *E. coli* then can be serotyped, using commercially available antisera, to determine whether they are O157:H7.

- Screening tests for *E. coli* O157 cannot be used to identify other types of STEC. An enzyme immunoassay (EIA) test is available that allows labs to directly test stool specimens for the presence of Shiga toxins, and therefore screen for all types of STEC. However, the Shiga-toxin EIA test only tests for the presence of Shiga-toxin in stool and does not require culturing of the *E. coli* organism. If only the EIA test is performed, there will be no isolate available for serotyping and pulsed-field gel electrophoresis (PFGE). Since serotype and PFGE information are crucial to the public health investigation of STEC and the identification of clusters and outbreaks, culture confirmation of specimens positive for Shiga-toxin by EIA tests is recommended.

- Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a PCR test with approximately 1-hour turnaround time, which makes it appealing, however, the PCR is run as a GI panel and often results in detection of several conditions. Investigations and reflex culture are required to confirm these results.

- Clinical laboratories that detect a diarrhea-associated STEC strain (whether an isolated case or in an outbreak situation) should send the isolate and/or Shiga-toxin EIA positive broth to the NMDOH Scientific Laboratory Division (SLD) for isolate confirmation and serotype identification.

- Hemolytic-Uremic Syndrome (HUS). For all patients with HUS, stool specimens should be cultured for *E. coli* O157:H7 and, if results are negative, for other STEC serotypes. However, the absence of STEC in feces does not preclude the diagnosis of STEC-associated HUS, since HUS typically is diagnosed a week or more after onset of diarrhea when the organism may no longer be detectable.

Treatment

- Dehydration and electrolyte abnormalities should be corrected. Orally administered solutions usually are adequate. Antimotility agents should not be administered to children with inflammatory or bloody diarrhea. Careful follow-up of patients with hemorrhagic colitis (including complete blood cell count with smear, platelet count, blood urea nitrogen level, and creatinine level) is recommended to detect changes suggestive of HUS. If patients have no laboratory evidence of hemolysis, thrombocytopenia, or nephropathy by three days after resolution of diarrhea, their risk of developing HUS is low.

- The role of antimicrobial therapy in patients with hemorrhagic colitis caused by STEC is uncertain. Antibiotic therapy is associated with HUS development. Azithromycin may effectively relieve symptoms. Fluoroquinolones can be used in persons over 18 years and rifaximin may be used for persons over 12 years.

Surveillance
Case Definition:

*Laboratory criteria* – Isolation of STEC from a clinical specimen. *E. coli* O157:H7 isolates may be assumed to be Shiga toxin-producing. For all other *E. coli* isolates, Shiga-toxin production or the presence of Shiga-toxin genes must be determined to be considered STEC.

*Confirmed case* – A case that meets the laboratory criteria.

*Probable case* – 1) a case with isolation of STEC from a clinical specimen, pending confirmation of H7 or Shiga-toxin production or; 2) a clinically compatible case that is epidemiologically linked to a confirmed or probable case or; 3) identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case, 4) a case that is positive by CIDT methods without culture

*Suspect case* – 1) A case of postdiarrheal HUS or TTP or 2) identification of Shiga-toxin in a specimen from a clinically compatible case without the isolation of the Shiga toxin-producing *E. coli*.

Reporting:

Report all suspected or confirmed cases of STEC to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Complete the NMDOH STEC Questionnaire and send to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered into NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio > STEC > Cryptosporidium > Salmonella > Shigella > Campylobacter > Cyclosporidium > Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. Case management

   1.1. Isolation:

   1.1.a During acute illness, implement contact precautions. During outbreaks, contact precautions for infants with diarrhea caused by STEC should be maintained until cultures of stool are negative.

   1.1.b Infected patients should not handle food or provide direct child or patient care in their place of employment until two successive negative stool cultures are obtained greater than 24 hours apart and at least 48 hours after last dose of antimicrobial therapy.

   1.1.c On a case-by-case basis, infected patients may return to work with modified duties that do not include handling food or providing direct child or patient care before two successive negative stool cultures are obtained. Decisions to allow patients to return to work will be made in consultation with ERD, local/regional public health staff, employee and employer.
2. Contact management

2.1. Isolation:

2.1.a Investigation of contacts should generally be limited to food handlers, staff and children in child care centers and other situations where spread of infection is particularly likely.

2.1.b Symptomatic contacts should be excluded from handling food and providing direct child or patient care until one negative stool culture has been obtained. If the symptomatic contact is taking antibiotics, the specimen should be obtained 48 hours after the last dose of antimicrobial therapy is taken.

2.1.c On a case-by-case basis, symptomatic contacts may return to work with modified duties that do not include handling food or providing direct child or patient care before two successive negative stool cultures are obtained. Decisions to allow contact to return to work will be made in consultation with ERD, local/regional public health staff, employee and employer.

2.1.d Thorough hand washing after using the bathroom and before food handling or child or patient care should be emphasized for all contacts.

2.2. Prophylaxis: Not applicable.

3. Prevention

3.1. Heat beef adequately (to 160 degrees) during cooking, especially ground beef.

3.2. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

3.3. General guidelines for preventing foodborne illness include:

- Thoroughly cook raw food from animal sources.
- Wash raw vegetables.
- Avoid unpasteurized dairy products.
- Wash hands, knives, and cutting boards after handling uncooked foods.

3.4. Immunization: Not applicable.

Management of STEC diarrhea in Child Care Centers

1. In an outbreak of diarrhea due to STEC and/or HUS in a child care facility, immediate involvement of public health authorities is critical. Infection by STEC is reportable, and rapid reporting of cases can lead to intervention to prevent further disease.

2. Management of isolated case

2.1. Infected child care center attendees should be excluded until two successive negative stool cultures are obtained greater than 24 hours apart and at least 48 hours after antimicrobial therapy is completed, if used.

2.2. Infected child care center staff members should not handle food or provide direct child care until two successive negative stool cultures are obtained greater than 24 hours apart and at least 48 hours after antimicrobial therapy is completed, if used.

2.2.a On a case-by-case basis, infected child care center staff members may return to work with modified duties that do not include handling food or providing direct child care.
care before two successive negative stool cultures are obtained. Decisions to allow the staff member to return to work will be made in consultation with ERD, local/regional public health staff, employee and employer.

2.3. Per child care licensing regulations, a center should notify parents or guardians in writing of a case of STEC in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 7 for a template of a notification letter.

2.4. Stool specimens from other symptomatic attendees and staff members should be cultured.

2.4.a Symptomatic attendees should be excluded until two successive negative stool cultures are obtained greater than 24 hours apart and 48 hours after last dose of antimicrobial therapy.

2.4.b Symptomatic child care center staff members should not handle food or provide direct child care until two successive negative stool cultures are obtained greater than 24 hours apart and 48 hours after last dose of antimicrobial therapy.

2.4.c On a case-by-case basis, symptomatic child care center staff members may return to work with modified duties that do not include handling food or providing direct child care before two successive negative stool cultures are obtained. Decisions to allow the staff member to return to work will be made in consultation with Epidemiology and Response Division (ERD), local/regional public health staff, employee and employer.

3. The child care center should review its infection control protocols with staff, and emphasize the following:

- Standard precautions should be followed. Strict hand washing routines for staff and children, and routines for handling fecally contaminated materials.
- Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, and then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).
- Food-handling and diaper changing areas should be physically separated and cleaned daily.
- Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.
- Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

4. The day care operator should be instructed to call the local public health office (PHO) or ERD (depending on collaborative plan developed for surveillance and follow up) immediately if new cases of diarrhea occur. The day care center should be called or visited once each week for two weeks after onset of the last case to verify that surveillance and appropriate hygienic measures are being carried out.

5. Outbreak
5.1 If an outbreak of STEC diarrhea (i.e., two or more cases) is suspected in a child care facility, ERD should be notified immediately. Outbreaks of STEC in this situation would ordinarily be controlled by exclusion and evaluation of symptomatic children and staff.

References


What are STEC infections?
STEC (for example, *E. coli* O157:H7) are a group of *E. coli* bacteria that can cause bloody diarrhea, severe complications and sometimes death. Not all types of *E. coli* cause illness.

What are the symptoms of an STEC infection?
The symptoms usually start within 3 to 4 days, but the range is 2 to 8 days after exposure. The most common symptoms are stomach cramps and bloody diarrhea. Sometimes persons will also have fever, chills and vomiting. Some persons will not have any symptoms, or they may have mild diarrhea that is not bloody. In a small number of cases, the infection may cause the kidneys to stop working, especially in young children.

How is STEC spread?
STEC bacteria may be spread by eating “dirtied” or contaminated water or food (particularly ground beef or raw milk). Infected persons can spread the bacteria by not washing their hands after going to the bathroom and then handling food that other people will eat. Another way to get this disease is by having direct contact with stool (feces) from an infected person or animal and then transferring the bacteria to the mouth from the hands.

How long are people contagious?
An infected person may spread the bacteria to others for as long as the bacteria remain in the stool, usually one week but up to three weeks or more.

Who gets STEC infections?
Anyone can get STEC but it is recognized more often in children than adults. Because there are many different strains of STEC, people can become re-infected.

What treatment is available for people with STEC?
Most STEC infections will go away without treatment. If you have bloody diarrhea, you should see a doctor. Persons who get STEC should not take antibiotics. Persons with diarrhea should drink plenty of fluids.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria is found in stool, children should not go to daycare or school while they have diarrhea and food handlers should be excluded from work. Daycare attendees and workers and food handlers should only return to daycare/work after two negative stool culture results.

How can I protect myself and my family from getting STEC?
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper, or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Avoid food or water from sources that may be contaminated.
- Wash raw fruits and vegetables prior to eating or chopping.
- Always treat raw poultry, beef and pork as if they are contaminated and handle accordingly.
- Wrap fresh meats in plastic bags at the market to prevent blood from dripping on other foods.
- Refrigerate foods promptly; minimize time kept at room temperature.
- Immediately wash cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached, particularly when cooking using a microwave.
¿Qué es la STEC?
STEC (por ejemplo, *E. coli* O157:H7) son un grupo de bacterias llamadas *E. coli* que pueden producir diarrea con sangre, complicaciones severas y, algunas veces, muerte. No todos los tipos de *E.coli* causan enfermedades.

¿Cuáles son los síntomas de una infección por STEC?
Los síntomas pueden aparecer entre 2 y 8 días después de haber estado expuesto, pero suelen aparecer entre 3 y 4 días. Los síntomas más comunes son retorciones en el estómago y diarrea con sangre. A veces, también puede darse fiebre, escalofríos y vómitos. Algunas personas pueden no tener ningún síntoma o sólo tener una diarrea leve pero sin sangre. En un pequeño número de casos, la infección puede afectar a los riñones y causar que éstos dejen de funcionar, especialmente en niños pequeños.

¿Cómo se transmite la STEC?
STEC se puede transmitir al comer comida o beber agua contaminadas (sucias), especialmente si es carne molida de res o leche no pasteurizada. Las personas infectadas pueden transmitir la bacteria si no se lavan las manos después de ir al baño y entonces tocan la comida que otros van a comer. Otra forma de contraer esta enfermedad es por contacto directo con las heces de una persona o animal infectados, después de tocarlos se transfiere la bacteria de las manos a la boca.

¿Por cuánto tiempo puede alguien contagiar a otros?
Una persona infectada puede transmitir la bacteria a otros mientras ésta se encuentre presente en las heces, normalmente durante una semana, pero puede ser hasta tres semanas o más.

¿Quién puede contraer una infección por STEC?
Cualquiera puede contraerla, pero es más frecuente en niños que en adultos. Como hay muchos tipos diferentes de la bacteria STEC, puede volver a ocurrir en cualquier momento.

¿Cómo se trata una infección por STEC?
La mayoría de las infecciones por STEC desaparecen sin ningún tratamiento. Las personas infectadas por STEC no deben tomar antibióticos. Si usted tiene diarrea con sangre, vaya a un médico. Las personas que tienen diarrea deben beber muchos líquidos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
La bacteria está presente en las heces, por eso los niños no deben ir a la guardería o a la escuela mientras tengan diarrea. Las personas que trabajan manipulando alimentos no deben ir al trabajo. Los niños y trabajadores de la guardería, y los manipuladores de alimentos podrán regresar cuando tengan dos resultados negativos en sus pruebas de heces y la aprobación de las autoridades de salud pública.

¿Cómo puedo protegerme yo y también proteger a mi familia contra estas infecciones?
• Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
• Evite agua o comida que puedan provenir de fuentes contaminadas.
• Lave las frutas y verduras antes de comerlas o cortarlas.
• Siempre trate la carne cruda de pollo, pavo, res y puerco con precaución, como si estuviera contaminada, y manipule de forma adecuada.
• Ponga la carne cruda dentro de bolsas de plástico cuando la compre en el mercado para que la sangre de ésta no se mezcle con otros alimentos.
• Ponga los alimentos en el refrigerador pronto, deben pasar el menor tiempo posible fuera.
• Lave inmediatamente los tableros para cortar y mostradores que ha usado para preparar estos alimentos, de esta forma evita que otros alimentos se puedan contaminar.
• Asegúrese de que la carne alcanza la temperatura interna correcta cuando se cocina, sobre todo si usa un microondas para cocinarla.
Giardiasis

Summary
Giardiasis is a parasitic intestinal disease that may result in asymptomatic infection; acute, self-limited diarrhea; or chronic intermittent symptoms. The disease is spread primarily person to person or through ingestion of contaminated water. A typical case of giardiasis presents with frequent loose stools with mucous but no blood, dull epigastric pain, and flatulence. Some individuals experience chronic intermittent diarrhea, weight loss, bloating, or stomach cramps. Infection is diagnosed by direct examination of stool or by stool antigen detection. There are several antiparasitic agents available to treat giardiasis. Control measures include good hand hygiene practices and avoiding drinking of untreated surface water.

Agent
*Giardia intestinalis* (also known as *G. lamblia* and *G. duodenalis*) is a flagellated protozoan parasite.

Transmission
Reservoir:
This enteric parasite affects humans and a range of domestic and wild animals (e.g., cats, dogs, cattle, deer and beavers). However, the role of animals as reservoirs is unclear.

Transmission:
Direct person-to-person (fecal-oral) transmission is probably the principal mode of spread. This may occur when cysts in feces of an infected person are passed hand to mouth to an uninfected person. This is probably the most common mode of spread among children, especially for toddlers in diapers. The prevalence of infection is highest in areas of poor sanitation and in institutions (including child care centers). Fecal-oral transmission also occurs from the ingestion of *Giardia* cysts through the consumption of fecally contaminated food or water; this accounts for many cases reported in campers and hikers who drink untreated water. Community-wide outbreaks have occurred when municipal systems have become contaminated or when filtration systems have been bypassed or broken.

Period of Communicability:
The period of communicability is as long as the organism is excreted in stool. The infectious dose is small; ingestion of 10 cysts has been reported to cause infection. Infected persons have been reported to shed 1-10 billion cysts in their stool daily and this might last for several months. Symptomatic giardiasis in adults usually lasts from 2 weeks to 2 months; however, chronic giardiasis, usually only found among those who are immunocompromised, may persist for many months to years. Asymptomatic carriage and shedding of *Giardia* may persist for months.

Clinical Disease
Incubation period:
Usually 3-25 days.

Illness:
Asymptomatic infection is common (in approximately 60%), and may occur more frequently in children or in people with prior infections. Symptomatic patients have diarrhea with loose, foul-smelling stools. Blood is not present in stools. A more protracted diarrheal illness can occur with symptoms of flatulence, abdominal distention, cramps, fatigue, and anorexia. There can be significant weight loss and malabsorption. Symptoms can persist for several weeks.

**Laboratory Diagnosis**

Laboratory confirmed giardiasis is defined as the detection (in symptomatic or asymptomatic persons) of *Giardia intestinalis* cysts in stool specimens or trophozoites in stool specimens, duodenal fluid, or small-bowel tissue by microscopic examination using staining methods (e.g., trichrome) or direct fluorescent antibody (DFA) assays; or antigens in stool specimens by immunodiagnostic testing (e.g., enzyme-linked immunosorbent assay). Tests using enzyme immunoassay (EIA) or immunofluorescent antibody (IFA) methods for detection of *Giardia* antigen in the stool (or duodenal fluid) are commercially available and are generally more sensitive than direct microscopy.

Because excretion of the cysts can be sporadic, the sensitivity of stool examination can be improved by repeat testing (generally up to three stool samples). To enhance detection, stool exam should be done shortly after collection, or stool should be placed in a fixative. SLD no longer provides transport media for ova and parasite (O and P) exams nor does it do any stool testing for *Giardia*.

Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a PCR test with approximately 1-hour turnaround time, which makes it appealing, however, the PCR is run as a GI panel and often results in detection of several conditions at the same time. Investigations are needed to confirm all results.

**Treatment**

All treatment decisions should be made in consultation with the patient’s health care provider.

- Metronidazole, tinidazole or nitromidazole are the drugs of choice. Cure rates range from 80 to 100% depending on the drug used.
- If therapy fails, a course can be repeated with the same drug. Relapse is common in immunocompromised patients who may require prolonged treatment. Treatment of asymptomatic carriers is generally not recommended but could be considered for carriers in households of patients with hypogammaglobulinemia or cystic fibrosis.

**Surveillance**

**Case Definition:**

*Laboratory criteria* - Demonstration of *G. intestinalis* cysts in stool; or demonstration of *G. intestinalis* trophozoites in stool, duodenal fluid, or small-bowel biopsy; or demonstration of *G. intestinalis* antigen in stool by a specific immunodiagnostic test.

*Confirmed* – A case that is laboratory confirmed and meets the clinical description.

*Probable* – A clinically compatible case that is epidemiologically linked to a confirmed case.

**Reporting:**

Report all suspected, probable, or confirmed cases of giardiasis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s
name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

*Use the Foodborne Surveillance Investigation Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.*

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: *Vibrio* > STEC > Cryptosporidium > Salmonella > Shigella > Campylobacter > Cyclospora > Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. **Case management**
   1.1. **Isolation:**
      1.1.a Exclude *symptomatic* persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Persons may be allowed to resume usual duties when:
      - Diarrhea has resolved, and
      - Proper hygiene measures can be maintained (as assessed by a food sanitarian, trained environmentalist, or infection control practitioner). In the instance of a food handler, contact the Environment Department’s district food program and in the case of a health care worker, contact the facility’s infection preventionist to assess the risk for transmission.

      1.1.b Exclusion of *asymptomatic* infected persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients may be indicated if their food handling or personal hygiene habits (as assessed by a food sanitarian, trained environmentalist, or infection preventionist) are inadequate to prevent transmission of enteric infection to patrons or patients. They need not be excluded from work if proper hygiene measures are maintained.

      1.1.c For hospitalized or institutionalized patients, *Giardia* requires standard precautions but for diapered or incontinent patients including children less than 6 years of age, *Giardia* requires the additional use of contact precautions.

1.2. **Prophylaxis:** Not applicable.

2. **Contact management**

Isolation: Household or other close contacts should have their stool examined for *Giardia* if they are symptomatic. Because of intermittent shedding, three negative specimens taken at least 24 hours apart should be obtained to rule out infection. Exclude symptomatic contacts from food handling.

2.1. **Prophylaxis:** Not applicable.

3. **Prevention**
3.1. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

3.2. Backpackers, campers, and other persons at risk for exposure to contaminated water should avoid drinking water directly from surface water sources (e.g., lakes, rivers, streams). Boiling of water for at least one minute will kill the infective cysts.

3.3. Prevent contact and contamination with feces during sex by using a barrier (e.g., condom) during oral-anal sex and washing hands immediately after either handling a condom used during anal sex or after touching the anus or rectal area.

3.4. To prevent the contamination of recreational waters, do not swim when ill with diarrhea.

3.5. Immunization: Not applicable.

Management of Giardia in Child Care Centers

1. Persons with diarrhea should be excluded from child care until they are asymptomatic.

2. Per child care licensing regulations, a center should notify parents or guardians in writing of a case of Giardia in the facility. See Appendix 7 for a template of a notification letter.

3. If an outbreak is suspected, contact ERD at 505-827-0006. An investigation will be undertaken to identify and treat all symptomatic children, child care staff, and family members infected with Giardia. Exclusion of asymptomatic carriers from child care is not recommended.

4. The child care center should review its infection control protocols with staff, and emphasize the following:

   • Standard precautions should be followed. Strict hand washing routines for staff and children, and routines for handling fecally contaminated materials.

   • Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, and then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).

   • Food-handling and diaper changing areas should be physically separated and cleaned daily.

   • Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.

   • Ideally, institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation, but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.
- Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

References


Centers for Disease Control. ABCs of safe and healthy child care. Atlanta, GA: Centers for Disease Control and Prevention; 1996.


What is giardiasis?
Giardiasis is an intestinal or stomach illness caused by a microscopic organism called *Giardia lamblia*.

What are the symptoms of giardiasis infection?
People infected with *Giardia* may have mild or severe diarrhea. Symptoms may appear from 1 to 4 weeks after exposure but usually within 10 days. Fever is rarely present. In some instances, infected persons will have no symptoms at all. Sometimes, infected persons will have chronic diarrhea over several weeks or months, with significant weight loss.

How is *Giardia* spread?
Person-to-person transmission due to poor hand washing practices is probably the main way that *Giardia* parasites are spread, especially in day care centers and institutions. In addition, feces from an infected person or animal may “dirty” or contaminate water or food.

How long are people contagious?
Persons may continue to have *Giardia* in their stools (feces) from a few weeks to a few months. Treatment may shorten the time that people are contagious.

Who gets giardiasis?
Anyone can get giardiasis, but it tends to occur more often in people in institutional settings or people in day care centers. Also, foreign travelers and individuals who consume improperly treated surface water (such as streams) are at higher risk for getting giardiasis.

What treatment is available for people with giardiasis?
Often your health care provider will give you medicine to treat giardiasis. Some individuals may recover on their own without medication. Persons with diarrhea should drink plenty of fluids.

Do infected people need to be kept home from school, work or daycare?
Infected persons should not go to day care, or to jobs involving patient care or food handling. Most people may return to work or school when diarrhea stops. At all times, they should maintain good hand hygiene practices.

How can I protect myself and my family from getting giardiasis?
You can decrease your chance of coming in contact with Giardia with these practices:

- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Promptly clean contaminated surfaces with household chlorine bleach-based cleaners.
- Carefully dispose of sewage wastes so as not to contaminate surface or groundwater.
- Avoid food or water from sources that may be contaminated.
¿Qué es la giardiasis?
La giardiasis es una enfermedad del estómago o de los intestinos ocasionada por un organismo microscópico que se llama *Giardia lamblia*.

¿Cuáles son los síntomas de la giardiasis?
Las personas infectadas con *Giardia* pueden tener diarrea de leve a grave. Los síntomas pueden aparecer entre 1-4 semanas después de haber estado expuesto, pero lo normal es que aparezcan en 10 días. Es raro que haya fiebre. En algunos casos, no se presentan síntomas. A veces, la diarrea puede ser crónica y continuar por semanas o meses, y conduce a una pérdida de peso considerable.

¿Cómo se transmite la giardiasis?
La forma más fácil de transmisión para los parásitos *Giardia* es de persona a persona al no lavarse las manos de forma adecuada, sobre todo en guarderías y otras instituciones. Además, las heces de una persona o animal infectados pueden “ensuciar” o contaminar el agua o los alimentos.

¿Por cuánto tiempo puede alguien con giardiasis contagiar a otros?
El organismo *Giardia* puede estar presente en las heces de la persona infectada por semanas o hasta unos meses. Con tratamiento se puede reducir el tiempo durante el cual una persona es contagiosa.

¿Quién puede contraer la giardiasis?
Cualquiera puede contraerla, pero ocurre con más frecuencia en personas que asisten o trabajan en instituciones para el cuidado y guarderías. También, los viajeros internacionales y las personas que beban agua de fuentes contaminadas no tratadas (como arroyos o ríos) tienen un riesgo mayor de contraer la enfermedad.

¿Cómo se trata la giardiasis?
A menudo su médico le dará medicinas para tratar la giardiasis. Algunas personas se pueden recuperar por sí solas sin medicación. Si se tiene diarrea, es necesario beber muchos líquidos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas infectadas no deben ir a la guardería o a la escuela, tampoco al trabajo si está relacionado con el cuidado de pacientes o la manipulación de alimentos. Muchas personas pueden regresar al trabajo o a la escuela cuando ya no tienen diarrea. Sin embargo, deben lavarse las manos con cuidado después de usar el baño, cambiar pañales o antes de preparar comida.

¿Cómo puedo protegerme y también proteger a mi familia contra la giardiasis?
Para reducir las posibilidades de entrar en contacto con el parásito *Giardia*, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Limpie de inmediato las superficies contaminadas en su casa con un producto limpiador para la casa que contenga cloro.
- Elimine desechos residuales o aguas negras con cuidado de no contaminar otras fuentes de agua (como agua de ríos, pozos, etc.).
- Evite agua o comida que puedan provenir de fuentes contaminadas.
Haemophilus influenzae Invasive Disease

Summary

Haemophilus influenzae are gram-negative coccobacilli that cause a broad range of infections. The organism is transmitted person to person by respiratory droplets. The most common manifestations of invasive disease are bacteremia, meningitis, and pneumonia. Signs and symptoms may include fever, headache, meningismus, cough, respiratory distress, or general ill appearance. Diagnosis is made by bacterial culture or polymerase chain reaction (PCR). Antimicrobial treatment is indicated for invasive H. influenzae infections to prevent poor patient outcomes and sequelae.

Agent

General: Haemophilus influenzae is classified into six capsular types (a through f) and nonencapsulated (nontypable) strains.

Transmission

Reservoir: Humans.

Mode of transmission:

   General: The organism resides in the human upper respiratory tract. Person-to-person transmission occurs through inhalation of respiratory tract droplets or through direct contact with respiratory tract secretions from infected or colonized individuals. Pharyngeal colonization is common, especially with non-type b strains.

   Type B: Widespread use of Hib conjugate vaccine has markedly reduced colonization rates for type b. Colonization rates increase following recent exposure in closed populations (such as family or child care contacts of a person with disease).

Period of communicability:

   General: Undefined as the organism can be transmitted as long as it is present in the nasopharynx.

   Type B: For patients with invasive Hib disease, the patient is considered noninfectious 24 hours after initiation of appropriate antimicrobial therapy.

Clinical Disease

Incubation period:

   Unknown.

Illness:

   When bacteria disseminate from the mucosal surfaces of the upper respiratory tract into the bloodstream and elsewhere in the body, clinical illness occurs. The most common manifestations of invasive disease are bacteremia, meningitis, pneumonia, epiglottitis, septic arthritis or other musculoskeletal disease. Signs and symptoms may include fever, headache, meningismus, cough, respiratory distress, bone or joint pain, or general ill appearance. Non-encapsulated or nontypeable strains of H. influenzae usually cause noninvasive infections including otitis media, sinusitis, conjunctivitis, pneumonia, and bronchitis.
Laboratory Diagnosis

Culture: *H. influenzae* can be cultured from blood, cerebrospinal fluid (CSF), synovial fluid, sputum, and pleural fluid. A gram stain of infected body fluid can demonstrate the organism and allow a presumptive diagnosis to be made. All *H. influenzae* isolates associated with invasive disease must be serotyped (which is performed at New Mexico Department of Health Scientific Laboratory Division).

Antigen detection: Because the type b capsular antigen can be detected in body fluids, including urine, blood, and CSF of patients, clinicians often request a rapid antigen detection test for diagnosis of Hib disease. Antigen detection may be used as an adjunct to culture, particularly in the diagnosis of patients who have received antimicrobial agents before specimens are obtained for culture. The method for antigen detection is latex agglutination (LA). LA is a rapid and sensitive method used to detect Hib capsular polysaccharide antigen in CSF, serum, urine, pleural fluid, or joint fluid but false negative and false positive reactions can occur.

If the Hib antigen is detected in CSF but a positive result is not obtained from culture of sterile site, the patient should be considered as having a probable case of Hib disease and reported as such. Because antigen detection tests can be positive in urine and serum of persons without invasive Hib disease, persons who are identified exclusively by positive antigen tests in urine or serum should not be reported as cases. Real-time PCR detects DNA of all *H. influenzae* in blood, CSF, or other clinical specimens. A major advantage of PCR is that it allows for detection of *H. influenzae* from clinical samples in which the organism could not be detected by culture methods, such as when a patient has been treated with antibiotics before a clinical specimen is obtained for culture. Even when the organisms are nonviable following antimicrobial treatment, PCR can still detect *H. influenzae* DNA. Isolation of the bacterium is needed to confirm *H. influenzae* invasive disease, determine the serotype, and test for antimicrobial susceptibility.

Treatment

Patients with invasive *H. influenzae* must receive antimicrobial therapy. The choice of specific therapy should take into account local antibiotic susceptibility patterns of invasive isolates. Treatment decisions are made by the patient’s health care provider; consultation with infectious disease specialists can be beneficial in treating invasive infections.

Surveillance

Case Definition:

*Confirmed* – A clinically compatible case associated with isolation of *H. influenzae* by culture from a normally sterile site.

*Probable* – A clinically compatible case with detection of *H. influenzae* antigen in CSF.

Reporting:

Report all suspected, probable or confirmed cases of invasive *H. influenzae* immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s name, age, sex, race, ethnicity, home address, home phone number, occupation and health care provider.
Use the Bacterial Meningitis Invasive Respiratory Disease (BMIRD) Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

Control Measures (type b only)

1. Case management
   
   1.1. Isolation: For hospitalized patients with invasive Hib disease, droplet precautions should be used for 24 hours after initiation of antimicrobial therapy.
   
   1.2. Prophylaxis: Treatment of Hib disease with cefotaxime or ceftriaxone eradicates Hib colonization. Therefore, there is no need for prophylaxis of an index case that has been adequately treated with those medications. However, an index case who has been treated with meropenem, ampicillin or chloramphenicol, and who is younger than 2 years old or who have a susceptible household contact, should receive rifampin prophylaxis at the end of therapy for invasive infection.

2. Contact management
   
   2.1. Isolation: Not applicable.
   
   2.2. Indications and Guidelines for Rifampin Chemoprophylaxis for Contacts of Index Cases of Invasive Haemophilus influenzae, type b (Hib) disease.

Type b: Chemoprophylaxis with rifampin is indicated for close contacts of patients with invasive Haemophilus influenzae type b (Hib) disease. Two Hib conjugate vaccines are currently licensed for routine immunization in infants. Prior to introduction of H. influenzae type b (Hib) conjugate vaccine, the majority of invasive disease in children was caused by type b. The epidemiology of invasive H. influenzae infection has changed in the post-Hib vaccination era, with the majority of the disease now caused by nontypeable H. influenzae in all age groups. Rifampin should be given orally once a day for four days, in a dose of 20 mg/kg (maximum daily dose 600 mg). For infants aged less than one month, the dose is not well established; 10 mg/kg has been recommended by some experts. The adult dose is 600 mg.

Prophylaxis Recommended:
1. For all household contacts¹ (except pregnant women) in the following circumstances:
   
   a. Household with at least one contact younger than 4 years of age who is unimmunized or incompletely immunized²
   
   b. Household with a child younger than 12 months of age who has not completed the primary Hib series
   
   c. Household with a contact who is an immunocompromised child, regardless of that child’s Hib immunization status

2. For preschool and child care center contacts when two or more cases of Hib invasive disease have occurred within 60 days.

3. For index patient, if younger than 2 years old or a member of a household with a susceptible contact and treated with a regimen other than cefotaxime or ceftriaxone, chemoprophylaxis usually is provided just before discharge from the hospital

Prophylaxis NOT Recommended:
1. For occupants of households with no children younger than 4 years old other than the index patient
2. For occupants of households when all household contacts 12 through 48 months of age have completed their Hib immunization series and when household contacts younger than 12 months of age have completed their primary series of Hib immunizations.


4. For pregnant women

Prophylaxis is not recommended for contacts of cases with non-type b invasive infection.

1. It is unknown whether persons (particularly young children) in contact with a person with invasive non-type b *H. influenzae* disease are at increased risk for disease. Also unknown is whether chemoprophylaxis is efficacious under these circumstances. There have been very few documented cases of secondary disease in close contacts of invasive non-type b *H. influenzae* disease. Therefore, currently, ERD does not recommend chemoprophylaxis for contacts of non-type b *H. influenzae* cases.

2. Testing of asymptomatic contacts is not recommended

1 Defined as people residing with the index patient or nonresidents who spent four or more hours with the index case for at least 5 of the 7 days preceding the day of hospital admission of the index case.

2 Complete immunization is defined as having had at least one dose of conjugate vaccine at 15 months of age or older; two doses between 12 and 14 months of age; or 2 or 3 dose primary series depending on vaccine type (see below Vaccine Section).

2.3. Surveillance

Careful observation of exposed unimmunized or incompletely immunized household, child care, or nursery contacts is essential. Exposed children who develop a febrile illness should be evaluated immediately.

**Vaccination**

The Advisory Committee on Immunization Practices (ACIP) is a group of medical and public health experts that develop recommendations on use of vaccines in the US, recommendations for the use of Hib vaccine in children and adolescents aged 18 years or younger can be found at: https://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

**Management of Invasive *H. influenzae*, type b (Hib) Disease in Child Care Centers**

(from: http://www.cdc.gov/vaccines/pubs/sury-manual/chpt02-hib.html#vaccination)

When two or more cases of invasive Hib disease have occurred within 60 days and unimmunized or incompletely immunized children attend the child care facility or preschool, rifampin prophylaxis of all attendees (irrespective of their age and vaccine status) and child care providers should be considered. In addition to these recommendations for chemoprophylaxis, unimmunized or incompletely immunized children should receive a dose of vaccine and should be scheduled for completion of the recommended age-specific immunization schedule. Data are insufficient regarding the risk of secondary transmission to recommend chemoprophylaxis for attendees and child care providers when a single case of invasive Hib disease occurs. The decision to provide chemoprophylaxis in this situation is at the discretion of the ERD medical epidemiologists.
The Advisory Committee on Immunization Practices recommends that because children who attend child care are at increased risk for Hib disease, efforts should be made to ensure that all child care attendees younger than 5 years old are fully vaccinated. Children < 24 months of age who develop invasive Hib disease should repeat the Hib vaccine series because they can remain at risk of a second episode of disease; children >24 months of age who develop invasive Hib disease usually develop a protective immune response and do not need immunization. The risk of Hib invasive disease for child care center contacts of a patient with Hib invasive disease case is thought to be lower than that for a susceptible household contact. Public health officials should refer to the most recent edition of American Academy of Pediatrics (AAP) Red Book for information on chemoprophylaxis of child care center contacts.

References


HAEMOPHILUS INFLUENZAE Type B

What is Haemophilus influenzae, type b (Hib) disease?
Hib may cause serious bacterial infections in young children. Hib may cause a variety of
diseases such as meningitis (inflammation of the coverings of the spinal column and brain),
blood stream infections, pneumonia, arthritis, epiglottitis and infections of other parts of the
body.

What are the symptoms of Hib?
Symptoms generally appear in less than 10 days after exposure, commonly within 2 to 4 days.
Fever, vomiting, listlessness and a stiff neck or back are some common symptoms. Other
symptoms depend upon the part of the body affected.

How is Hib spread?
Hib disease may be spread through contact with mucus or droplets from the nose and throat
of an infected person.

How long are people contagious?
The contagious period varies and, unless treated, may last for as long as the bacteria are
present in the nose and throat, even after symptoms have gone away. A person can no longer
spread Hib disease after taking antibiotics for one day.

Who gets Hib disease?
Hib disease is most common in children 3 months to 3 years old. Hib disease is less common
in persons over 5 years old.

What treatment is available for people with Hib?
Antibiotics are used to treat Hib infections.

Do infected people need to be kept home from school, work or daycare?
People who have Hib will most probably be in the hospital. Persons infected with Hib can
spread the bacteria until 24 hours after initiation of appropriate antibiotics.

How can I protect myself and my family from getting Hib?
- All children should be vaccinated against Hib beginning at approximately 2-months of age.
- If you have been in close contact with the ill person, preventive medication is only
  recommended in specific instances. For example, preventative treatment with an antibiotic is
  recommended for household members when there is at least one unvaccinated child
  under 4-years old in the home.
- You should also wash hands well and often with soap and water and teach children to
  wash their hands too. (Sanitizing gel may be substituted when hands are not visibly
  soiled.)
- Always cover your nose and mouth when you cough or sneeze, and then wash your hands.
¿Qué es el Hib (Haemophilus influenzae, tipo b)?
El Hib puede ocasionar infecciones bacterianas graves en niños pequeños. El Hib puede causar enfermedades muy diversas como meningitis (inflamación del tejido que cubre el cerebro y la médula espinal), infección en la sangre, neumonía, artritis, epiglotitis (infección en la zona de la garganta que pone en riesgo la vida) e infecciones en otras partes del cuerpo.

¿Cuáles son los síntomas de Hib?
Los síntomas suelen aparecer en menos de 10 días después de haber estado expuesto, lo normal es que aparezcan de 2 a 4 días después. Los síntomas más frecuentes son fiebre, vómitos, falta de energía y rigidez en el cuello o espalda. Otros síntomas dependen de la parte del que cuerpo se vea afectada.

¿Cómo se transmite el Hib?
La enfermedad se puede transmitir por contacto directo con secreciones respiratorias (moco, esputo, saliva) de la nariz o la garganta, o por contacto con las gotitas que la persona infectada expulsa al toser o estornudar.

¿Por cuánto tiempo puede alguien con Hib contagiar a otros?
El periodo de contagio varía y, si no se trata, puede durar mientras las bacterias se encuentren presentes en la nariz y la garganta, incluso si los síntomas ya desaparecieron. La enfermedad deja de ser contagiosa cuando la persona infectada ya tomó antibióticos por un día.

¿Quién puede contraer Hib?
Esta enfermedad afecta sobre todo a niños de 3 meses a 3 años de edad. Es poco usual en personas mayores de 5 años.

¿Cuál es el tratamiento para Hib?
Se usan antibióticos para tratar este tipo de infecciones.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Lo más seguro es que las personas con Hib estén en un hospital. Las personas infectadas pueden contagiar a otros hasta que hayan completado un día (24 horas) de tratamiento con antibióticos.

¿Cómo puedo protegerme yo y también proteger a mi familia contra Hib?
- Todos los niños deben vacunarse contra Hib, la primera vacuna se recibe alrededor de los 2 meses de edad.
- Si tuvo contacto cercano con una persona enferma, el tratamiento preventivo sólo se recomienda para casos específicos. Por ejemplo, se recomienda tratamiento con antibióticos para todos los miembros de un mismo hogar cuando en la casa hay al menos un niño menor de 4 años de edad que no está vacunado.
- Lávese bien las manos con frecuencia con agua y jabón y enséñele a los niños a lavarse las manos también. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Siempre cúbrase la boca y la nariz al toser o estornudar y después lávese las manos.
Hantavirus Pulmonary Syndrome

Summary

Hantavirus Pulmonary Syndrome (HPS)\(^1\) is an acute zoonotic viral disease often characterized by fever, myalgia, and gastrointestinal complaints followed by the abrupt onset of respiratory distress and hypotension. The illness can progress rapidly to severe respiratory failure and shock. The reservoir for the virus in New Mexico is rodents of the genus *Peromyscus*, mainly the deer mouse *Peromyscus maniculatus*, which excretes the virus in its urine, feces, and saliva. Humans acquire infection primarily when they breathe in air contaminated with aerosolized virus particles from rodent urine, droppings, or saliva, and rarely through direct contact with infected rodents, rodent droppings, or nests.

Agent

Hantaviruses are ribonucleic acid (RNA) viruses of the *Bunyaviridae* family that cause HPS or hemorrhagic fever with renal syndrome (HFRS) in humans. Within the *Hantavirus* genus are the viruses that cause HFRS worldwide, particularly in Europe and Asia, and the viruses associated with HPS in the Americas. In the United States, five virus variants are known to cause disease in humans. The Sin Nombre virus (SNV) is responsible for the majority of HPS cases in the US and New Mexico. Bayou and Black Creek Canal viruses in the southeastern US and New York and Monongahela viruses in the eastern US have caused sporadic cases. Numerous hantavirus variants are also associated with HPS in South America.

Transmission

Reservoir:

Rodents, the natural hosts for hantaviruses, acquire a lifelong asymptomatic, chronic infection with persistent viremia, viruria, and virus in their saliva. New World hantaviruses are associated with rodent species of the subfamily Sigmodontinae. Each hantavirus variant has a single primary rodent host. In New Mexico and the US, the deer mouse, *Peromyscus maniculatus*, is the reservoir of Sin Nombre virus. Prevalence of infection varies widely geographically and temporally. Other Sigmodontine rodent species are associated with additional hantaviruses that have yet to be implicated in human disease. Therefore, it is best to consider all wild mice and rats infected.

Mode of Transmission:

Humans acquire infection most commonly through inhalation of aerosolized virus particles from rodent urine, droppings, or saliva. Transmission can also occur through direct contact with infected rodents, rodent droppings, or nests. The types of hantavirus that cause HPS in the United States cannot be transmitted person-to-person or via blood transfusion.

Clinical Disease

\(^1\) Also known as Hantavirus Cardiopulmonary Syndrome (HCPS)
Incubation Period:
Usually two to four weeks with a possible range from one to eight weeks.

Illness:
The prodromal illness of one to seven days is often characterized by fever; chills; fatigue; headache; myalgia of the shoulders, lower back, hips, and thighs; nausea; vomiting; diarrhea; abdominal pain; and dizziness. Cough and other upper respiratory symptoms are not present in the prodromal phase but begin at the onset of the cardiopulmonary phase.

The transition from the prodrome to the cardiopulmonary phase four to ten days later is typically heralded by the abrupt onset of cough, shortness of breath, hypoxia, and the appearance of pulmonary edema on chest radiographs. The extensive bilateral interstitial and alveolar pulmonary edema and pleural effusions are the result of a diffuse pulmonary capillary leak and seem to be immune-mediated. Severe myocardial depression is also seen in some cases. The crude mortality rate is 40%.

Laboratory Diagnosis
Presumptive laboratory values on a complete blood count (CBC) include a neutrophilic leukocytosis with immature granulocytes, more than 10% atypical immunoblasts (basophilic cytoplasm, prominent nucleoli, and an increased nuclear-cytoplasmic ratio), thrombocytopenia (below 150,000), absence of toxic granules in neutrophils and elevated hematocrit.

Confirmatory diagnosis is made by the demonstration of hantavirus-specific IgM antibodies or rising titers of hantavirus-specific IgG antibodies using ELISA, Western blot, or strip immunoblot techniques. Most patients have IgM antibodies at the time of hospitalization. PCR of autopsy or biopsy tissues and immunohistochemistry are also established diagnostic techniques in specialized laboratories.

Specific diagnostic testing in New Mexico is done by several commercial laboratories including TriCore Reference Laboratories. If a preliminary positive or equivocal IgM or IgG result is obtained the specimen undergoes confirmatory testing at the state Scientific Laboratory Division. It is important for physicians with suspected cases to consult with the on-call infectious disease physician at the University of New Mexico Hospital in Albuquerque (1-888-UNM-PALS) to assist in diagnosis and treatment.

Treatment
There is no specific treatment or cure for hantavirus infection. Patients with suspected HPS should be rapidly transferred to a tertiary care facility. Supportive management of pulmonary edema, severe hypoxemia, and hypotension during the first 24 to 48 hours is complex and critical for recovery. Overhydration must be avoided or pulmonary edema can be exacerbated. A flow-directed pulmonary catheter for monitoring fluid administration and use of inotropic support, vasopressors, and careful ventilatory control are important. Extracorporeal membrane oxygenation (ECMO) may provide important short-term support for the severe capillary leak syndrome in the lungs. Careful monitoring of cardiac function
should be included. Ribavirin, though active \textit{in vivo} against SNV, has not been shown to be effective in the treatment of HPS.

\section*{Surveillance}

\section*{Case Definition:}

\textit{Laboratory criteria} - Detection of hantavirus-specific IgM antibody or rising titers of hantavirus-specific IgG antibody; or detection of hantavirus-specific ribonucleic acid sequence by polymerase chain reaction (PCR) in clinical specimens; or detection of hantavirus antigen by immunohistochemistry.

\textit{Confirmed} – a clinically compatible case that is laboratory confirmed.

\section*{Reporting:}

Report all suspected or confirmed cases of hantavirus within 24 hours to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

\section*{Case Investigation:}

Complete the CDC Hantavirus Pulmonary Syndrome Surveillance Report form and mail to the Epidemiology and Response Division P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

\section*{Control Measures}

1. Case management
   
   1.1. Isolation: None required.
   
   1.2. Prophylaxis: Not applicable.

2. Contact management
   
   2.1. Isolation: None required
   
   2.2. Prophylaxis: Not applicable.

3. Prevention
   
   3.1. Environmental control: Infections with HPS are associated with domestic, occupational, or leisure activities bringing humans into contact with infected rodents, usually in a rural setting. Eradicating the host reservoir is neither feasible nor desirable. The best approach for disease control and prevention is risk reduction through environmental hygiene practices that discourage rodents from colonizing the home and work environment and that minimize aerosolization and contact with virus in saliva and excreta. The hantavirus has a lipid envelop which makes it susceptible to most disinfectants, including 10\% bleach solution, detergents, and most general household disinfectants. Depending on environmental conditions, these viruses probably survive <1 week in indoor environments and much shorter periods when exposed to sunlight outdoors. Measures to decrease exposure in the home and workplace include:
• Eliminating food sources, limiting possible nesting sites, sealing holes and other possible entrances (mice can squeeze through a hole the size of a dime), and using snap traps.

• Rodenticides can be effective but need to be used carefully to prevent poisoning of children and pets.

• Rodents killed with snap traps should be disinfected with 10% bleach solution and disposed of in the garbage. Do not reuse the traps. Rubber, latex, nitrile, or vinyl gloves should be worn and disinfected or discarded after use. Wash hands after removing gloves.

• Before entering areas with potential rodent infestations, doors and windows should be opened for at least 30 minutes to ventilate the enclosure. Persons entering these areas should avoid stirring up or breathing potentially contaminated dust.

• Dusty or dirty areas should be moistened with 10% bleach or other disinfectant solution and left to soak for five minutes before being cleaned.

• Upholstered furniture or carpet should be steam cleaned. Clean machine-washable fabrics with laundry detergent in hot water. Dry on high heat or air-dry in sun when possible.

• Brooms and vacuum cleaners should not be used to clean rodent-infested areas. A dust mask does not provide protection against viruses.

• For heavy rodent infestations use of disposable coveralls, rubber boots or disposable shoe covers, goggles, and an appropriate respiratory protection device such as a half-mask air-purifying (or negative-pressure) respirator with a high-efficiency particulate air (HEPA) filter or a powered air-purifying respirator (PAPR) with HEPA filters are recommended. Pulmonary function and fit testing must be performed before beginning any work requiring the use of a respirator.

3.2. Immunization: Not applicable.

Management of HPS in Child Care Centers

Person-to-person transmission of the viruses in the United States has not been demonstrated; therefore, no specific intervention is required.

References


What is Hantavirus Pulmonary Syndrome?
Hantavirus Pulmonary Syndrome (HPS) is an illness caused by a family of viruses called Hantaviruses. These viruses cause a rare, but very serious illness of the lungs.

What are the symptoms of Hantavirus Pulmonary Syndrome?
Symptoms usually start about two weeks after exposure but may start as soon as one week or as long as eight weeks later. Initial symptoms are fever, tiredness and muscle aches. Persons may also develop a headache, dizziness, chills, nausea, vomiting, diarrhea, and stomach pain. After a few days, persons will start coughing and have hard time breathing. These breathing problems can progress to respiratory failure and sometimes death. In some cases of HPS, the kidneys and other organs will stop working.

How is Hantavirus Pulmonary Syndrome spread?
In New Mexico, deer mice and other similar mice carry hantavirus. It is found in mice droppings and urine. Persons may get HPS by breathing in the virus. This can happen when droppings or urine containing the virus are stirred up and the virus is put in the air as mist or dust. Persons can also get hantavirus by touching their eyes, nose, or mouth after they have touched droppings or urine that contains the virus. People can also get hantavirus from a mouse bite, but this is rare.

How long are people contagious?
People are not contagious; a person with HPS cannot give hantavirus to another person.

Who gets Hantavirus Pulmonary Syndrome?
Anyone who lives in an area where mice are found can get hantavirus. This includes people from all parts of New Mexico.

What treatment is available for people with Hantavirus Pulmonary Syndrome?
At the present time, there is no specific treatment for HPS. If you have symptoms of hantavirus you should see a doctor immediately. Early intensive hospital care can save lives.

Do infected people need to be kept home from school, work or daycare?
People who have HPS will most likely be in the hospital. Since persons with HPS cannot spread it to other persons, they can return to work or school as soon as they feel well enough.

How can I protect myself and my family from getting Hantavirus Pulmonary Syndrome?

- Do not sweep or vacuum up mice droppings and urine. Spray them with ready-made disinfectant or bleach and water (1 cup bleach and 9 cups of water) mixture. While wearing rubber gloves, wipe up with a paper towel. Throw away the paper towel and wash your hands immediately.
- Keep your home clean to discourage rodents: wash dishes promptly, clean counters and floors, and put pet food and water away at night, store food and garbage in containers with tight lids.
- Look for holes inside and outside your home that mice may use to get inside and seal the holes up. (Remember rodents can squeeze through holes as small as a dime.)
- Set traps inside your home and clean up dead mice safely. To do this, spray the dead rodent with the ready-made disinfectant, place it in a plastic bag, and bury it or throw it away. Wash hands immediately.
- Control mice outside your house: clear brush and grass away from the foundation, place woodpiles and garbage as far away as possible from the house and get rid of junk that can provide homes for rodents.
- Open buildings, garages or basements that have been closed-up, to air them out for at least one hour before spending time inside.
- Avoid disturbing or sleeping near rodent droppings or burrows when camping. Avoid sleeping on bare ground; use a mat or elevated cot if available. Store foods in rodent-proof containers and promptly throw away, bury or burn all garbage.
¿Qué es el síndrome pulmonar por hantavirus?
El síndrome pulmonar por hantavirus (SPH) es una enfermedad ocasionada por una familia de virus que se llaman hantavirus. Estos virus pueden causar una enfermedad de los pulmones rara, pero a la vez muy grave.

¿Cuáles son los síntomas del síndrome pulmonar por hantavirus?
Los síntomas suelen comenzar dos semanas después de haber estado expuesto, aunque pueden aparecer a la semana o tardar hasta ocho semanas después. Los primeros síntomas son fiebre, cansancio y dolores musculares. También puede desarrollarse dolor de cabeza, mareo, escalofríos, náuseas, vómitos, diarrea y dolor de estómago. Después de algunos días, aparecerá tos y será difícil respirar. Estos problemas respiratorios pueden progresar y causar fallo respiratorio y, a veces, la muerte. En algunos casos, los riñones y otros órganos pueden dejar de funcionar.

¿Cómo se transmite el síndrome pulmonar por hantavirus?
En Nuevo México, el virus se encuentra en los excrementos y orina de los ratones de los ciervos y otros ratones similares. Se puede contraer esta enfermedad al respirar el virus. Esto puede ocurrir cuando se remueven los excrementos o la orina que contienen el virus y entonces éste pasa al aire en forma de polvo. También se puede contraer cuando la persona se toca los ojos, la nariz o la boca después de haber tocado los excrementos o la orina que contienen el virus. Otra forma de contraerla, aunque rara, es si a la persona le muerde un ratón.

¿Por cuánto tiempo puede alguien contagiar a otros?
Las personas no son contagiosas, el síndrome pulmonar por hantavirus no se transmite de persona a persona.

¿Quién puede contraer el síndrome pulmonar por hantavirus?
Cualquiera que viva en un área en la que haya ratones puede contraerlo. Esto incluye a personas de todas partes de Nuevo México.

¿Cómo se trata el síndrome pulmonar por hantavirus?
Por el momento no existe un tratamiento específico. Si usted tiene síntomas del hantavirus debe ir al médico de inmediato. La hospitalización temprana y cuidado médico intensivo puede salvar vidas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Es muy probable que una persona que tiene el síndrome pulmonar por hantavirus se encuentre en el hospital. Como no se puede transmitir de persona a persona, es posible regresar al trabajo o a la escuela tan pronto como se sienta bien para hacerlo.

¿Cómo me puedo proteger yo y proteger a mi familia contra el síndrome pulmonar por hantavirus?
- No barra o aspire los excrementos ni la orina de los ratones. En su lugar, use un desinfectante, lo puede comprar o preparar usted mismo con agua y cloro (una taza de cloro para 9 tazas de agua). Use guantes de goma y limpie con papel de cocina. Tire el papel a la basura y lávese inmediatamente las manos.
- Mantenga limpia su casa para evitar que haya ratones: lave los platos, limpie los mostradores y el piso, no deje la comida de las mascotas durante la noche, ponga la comida y la basura en recipientes cerrados.
- Busque agujeros adentro y afuera de su casa que los ratones puedan usar para entrar y tápelos. Recuerde que los ratones pueden entrar por agujeros tan pequeños como una moneda de 10 centavos.
- Ponga ratoneras dentro de su casa y limpie los ratones muertos de forma segura. Para eso, vierta el desinfectante ya preparado sobre el ratón muerto, colóquelo en una bolsa de plástico y entiérrelo o tírello. Lávese las manos de inmediato.
- Controle los ratones fuera de su casa: quite arbustos y hierbas cercanos al exterior de su casa, ponga la leña y basura tan lejos de su casa como sea posible y tire cualquier cosa que pueda servir de madriguera.
- Abra edificios, garajes o sótanos que han estado cerrados y permita que se ventilen por lo menos una hora antes de pasar tiempo adentro.
- Si va a acampar, no duerma cerca de excrementos o madrigueras de ratones, tampoco los toque. No duerma en la tierra, use un colchón o un catre, elevado del suelo si es posible. Guarde la comida en recipientes seguros contra los ratones y tire la basura, entiérrela o quémela de inmediato.
Hepatitis A

Summary
Hepatitis A is an acute viral illness characterized by the abrupt onset of fever, malaise, jaundice, anorexia, and nausea in older children and adults. Children younger than 6 years old are usually asymptomatic or have a mild infection typically without jaundice. It is transmitted by the fecal-oral route from infected individuals or through contaminated foods or water. Chronic infection does not occur.

Persons at increased risk of spreading the disease include: food handlers, staff and attendees of child care centers or babysitting services, and persons providing direct patient care in hospitals, nursing homes, or institutions. Once a diagnosis is confirmed, decisions can be made as to the administration of hepatitis A vaccine or immune globulin to contacts.

Agent
Hepatitis A virus (HAV) is a member of the family Picornaviridae.

Mode of Transmission
Reservoir:
Humans are the primary reservoir; rarely chimpanzees and other primates.

Mode of Transmission:
Primarily direct person-to-person transmission by the fecal-oral route (poor hand washing or anal contact). Transmission in food may be the result of an infected food handler inadequately hand washing or improperly handling foods; this especially applies to foods that are not cooked or that are handled after cooking. Consumption of improperly prepared food such as shellfish taken from contaminated waters (especially raw or undercooked mollusks) or inadequately washed produce may also serve as modes of transmission. Additionally, ingestion of water contaminated by sewage may be a mode of transmission.

Period of Communicability:
Most infectious in 1-2 weeks before onset of jaundice or elevated liver enzymes through the first week after onset of jaundice.

Clinical Disease
Incubation Period:
15-50 days, with an average of 28 days.

Illness:
Illness caused by hepatitis A virus is characteristically acute and self-limited with the following signs and symptoms: fever, malaise, jaundice, anorexia, dark urine, nausea, severe stomach pains and diarrhea. The likelihood of having signs and symptoms with HAV infection is related to age. In children aged <6 years, 70% of infections are asymptomatic; if illness does occur, it is typically not accompanied by jaundice. Prolonged, relapsing hepatitis for up to six months occurs in 15% of cases; chronic hepatitis A is not known to occur. In general, clinical severity increases with age, but complete recovery is the norm. Fulminant hepatitis is rare but is more common in people with underlying liver disease.
Laboratory Diagnosis

Serologic testing to detect immunoglobulin M (IgM) antibody to the capsid proteins of HAV (IgM anti-HAV) is required to confirm a diagnosis of acute HAV infection.

Serum HAV-IgM is present at the onset of illness and usually disappears within four months but may persist up to six months, and therefore represents a current or recent infection. False positives may occur and therefore, a diagnosis must meet case definitions listed below.

Treatment
Supportive.

Surveillance

Clinical case definition:

An acute illness with a) discrete onset of symptoms and b) jaundice, or elevated serum “liver enzymes” (e.g. aminotransferase levels) and does not have another likely explanation for the illness.

Laboratory criteria for diagnosis:

Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive.

Case Definition Confirmed:

A clinically compatible case that is laboratory confirmed or a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory confirmed hepatitis A (i.e., household or sexual contact with an infected person during 15-50 days before the onset of symptoms).

Reporting:

Report all cases of Hepatitis A to the Epidemiology and Response Division (ERD) at 505-827-0006 within 24 hours. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the Acute Hepatitis A Investigation Form to complete the Investigation. Information should also be entered in NM-EDSS per established procedures.

Control Measures

1. Case Management
   1.1. Isolation:
       Determine whether the case is at high risk for transmitting the disease.
       1.1 a High risk: Persons at increased risk of spreading the disease include:
           1. Food handlers.
           2. Staff and attendees of child care centers or babysitting services.
3. Persons providing direct patient care in hospitals, nursing homes, or institutions.

Exclude persons (children and adults) from high-risk settings until seven days after onset of jaundice or, in the absence of jaundice, for 14 days after the first appearance of symptoms. Readmission to a child care center may be allowed once Immune Globulin (IG) has been administered to appropriate children and staff.

4. Hospitalized patients: In addition to standard precautions, contact precautions are recommended for diapered and incontinent patients for one week after the onset of symptoms. The exception is an outbreak in a neonatal intensive care setting, where prolonged enteric precautions must be considered.

1.1 b No increased high risk: No exclusion is necessary. Provide health education that emphasizes thorough hand washing, mode of transmission, and period of communicability.

1.2. Prophylaxis: Not applicable.

2. Surveillance activities for hepatitis A evaluation:

2.1. Institute surveillance of illness among household contacts, day care contacts, food handler coworkers, or health care coworkers.

2.1.a Ask if others are thought to be ill with similar symptoms and, if so, inquire about possible common source exposures. Use the Hepatitis A Case Report Form to guide the interview.

3. Contact Management

3.1. Isolation: Symptomatic contacts of hepatitis A patients should be excluded from food handling, direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. These high-risk contacts who are symptomatic should be referred to a health care provider for evaluation and possible testing for HAV IgM antibody.

3.2. Prophylaxis: Prophylaxis should be provided to individuals whose last day of most recent exposure was two weeks or less. The efficacy of IG or vaccine when administered >2 weeks after exposure has not been established and therefore prophylaxis should not be administered if >2 weeks has elapsed since exposure. However, for individuals age 12 months and older, hepatitis A vaccine may be indicated for ongoing exposure.

3.2.a Healthy persons aged 12 months - 40 years should receive prophylaxis with a single-antigen hepatitis A vaccine at the age-appropriate dose.

3.2.b For persons aged >40 years, IG is favored because of the absence of information regarding vaccine performance and the more severe manifestations of hepatitis A in this age group. Vaccine can be used if IG cannot be obtained. The magnitude of the risk for HAV transmission from the exposure should be considered in decisions to use IG or vaccine. Persons administered IG for whom hepatitis A vaccine also is recommended for other reasons should receive a dose of vaccine simultaneously with IG. Persons >40 years of age who received HAV vaccine at least six months prior to their exposure should receive their second dose of vaccine. For immunocompromised persons and those with diagnosed chronic liver disease,
IG should be administered with vaccine. For persons who receive vaccine, the second dose should be administered per the licensed schedule to complete the series.

3.2.c IG should be used for: a) children aged <12 months; b) persons of any age who are immunocompromised or who have had chronic liver disease diagnosed; and c) persons for whom vaccine is contraindicated. True contraindications and precautions for HAV vaccine are: a) severe allergic reaction to a vaccine component or following a prior dose; b) moderate or severe acute illness.

3.2.d Prophylaxis is indicated as follows:

**Household, sexual, drug-using and other close personal contacts**

All previously unvaccinated and asymptomatic close personal contacts to a hepatitis A case should receive either IG (0.02 mL/kg) or single-antigen hepatitis A vaccine (per guidelines above). This includes household and sex contacts, and persons who have shared illicit drugs with someone with hepatitis A. Consideration should be given to providing IG or hepatitis A vaccine per above guidelines to persons with other types of ongoing, close personal contact (e.g., a regular babysitter or caretaker).

**Newborn infants of HAV-infected mothers**

Perinatal transmission of HAV is rare. Some experts advise giving IG to the infant if the mother’s symptoms began between two weeks before and one week after delivery.

**Management of hepatitis A in child care centers**

When a case of hepatitis A is reported in an attendee or staff member at a child care facility or if cases are recognized in two or more households of center attendees, the following recommendations apply:

- Notify the child care director that a case has occurred and provide education about the disease transmission. Conduct surveillance at the facility. If symptomatic contacts are identified, refer them to a healthcare provider for evaluation. If a symptomatic person meets the clinical case definition, then that individual is considered an epi-linked confirmed case. Consider laboratory testing of the epi-linked confirmed case for hepatitis A and identify their contacts for prophylaxis.

- In centers that do *not* provide care to children who wear diapers, single-antigen hepatitis A vaccine or IG should be given in a dose of 0.02 ml/kg to all previously unvaccinated staff in contact with the case and all children in the same classroom and exposed to the case.

- If the center admits children in diapers, single-antigen hepatitis A vaccine or IG should be given to *all* unvaccinated and exposed children and staff in the center and to all new unvaccinated admissions and new unvaccinated employees for six weeks after the last case at the center. Children and staff who have received at least one dose of hepatitis A vaccine administered at the appropriate age based on the formulation used are considered adequately vaccinated, and do not require IG. Refer to the American Academy of Pediatrics. Pickering LK, ed. 2015 Red Book: Report of the Committee on Infectious Diseases. 29th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015 for further details on vaccine formulations and recommended age of administration.
• When an outbreak occurs, single-antigen hepatitis A vaccine or IG also should be considered for members of households that have children (center attendees) in diapers.

Schools

School exposure generally does not pose an appreciable risk of infection, and prophylaxis is not indicated when a single case occurs unless behavior defined as close contact (see above) with a confirmed case is documented. However, prophylaxis could be used if transmission within the school setting is documented. Hepatitis A vaccine may also be considered in this situation.

Institutions and hospitals

In institutions for custodial care with an outbreak of HAV infection, residents and staff in close personal contact with infected patients should receive prophylaxis. Administration of prophylaxis to hospital personnel caring for patients with hepatitis A is not indicated routinely, unless an outbreak among patients or between patients and staff is documented. For persons receiving IG for prophylaxis, hepatitis A vaccine can be considered if repeated exposure is anticipated.

Management of Hepatitis A in a Food Establishment

When a case of hepatitis A is reported in a food handler, the following recommendations apply:

• ERD will contact the New Mexico Environment Department (NMED) or other appropriate environmental agency, depending on jurisdiction, immediately to coordinate inspection of the establishment where the patient is employed.

• Notify the food establishment’s manager that a case has occurred and provide education about the disease transmission.

• Conduct a site visit. The site visit should include an inspection by the appropriate environmental agency (and interview by NMDOH which may or may not be on site) about the case’s work station, job duties, schedule, and work habits.

• Conduct surveillance at the establishment. Institute surveillance for illness among all employees for the maximum duration of the incubation period. Assess illness among food handlers (including dates of illness, signs/symptoms, and work duties.) Each food handler should be interviewed individually and in private to obtain this information.

• Prophylaxis should be administered to all exposed, previously unvaccinated and asymptomatic employees in the food establishment.

• Perform interviews and serological testing on symptomatic employees.

• Make preliminary disease control recommendations (e.g., restricting symptomatic food handlers from working, closing a restaurant) in collaboration with environmental authority per jurisdiction.

• Evaluate the need for prophylaxis of patrons of the food establishment. Common-source transmission to patrons is unlikely, and therefore prophylaxis administration to patrons typically is not indicated but may be considered if 1) during the time when the food handler was likely to be infectious, the food handler both directly handled uncooked foods or foods
after cooking and had diarrhea or poor hygienic practices, and 2) patrons can be identified and treated <2 weeks after the exposure. In settings in which repeated exposures to HAV might have occurred (e.g., institutional cafeterias), stronger consideration of prophylaxis might be warranted. Consult with ERD for specific recommendations.

Common-source exposure

These outbreaks are often recognized too late for prophylaxis to be effective in preventing hepatitis A in exposed people. However, prophylaxis can be considered if it can be administered to exposed people within two weeks of the last exposure to the HAV-contaminated food or water. ERD recommends that all food handlers exposed to HAV within a food establishment receive prophylaxis.

Note: An unvaccinated employee in a high-risk setting who refuses prophylaxis should be excluded from high risk job duties until 50 days from the last exposure to the case.

4. Prevention

4.1. Education: Provide health education, reviewing transmission and communicability and emphasizing the importance of hand washing.

4.2. Immunization: HAV vaccine is recommended for people 12 months through 40 years of age for post-exposure prophylaxis and international travel. Updates for vaccination now include people traveling from the US to countries with high or intermediate HAV endemicity, and household members and other close personal contacts (e.g., regular child sitters) of adopted children newly arriving from countries with high or intermediate HAV endemicity. Hepatitis A vaccine is recommended for persons in high-risk groups including: persons at increased risk for HAV infection (persons with chronic liver disease or clotting factor disorders, men who have sex with men, injecting drug users, all susceptible persons traveling to countries where HAV is endemic, and persons who work with primates). In New Mexico, hepatitis A vaccine is recommended for all children beginning at 2 years of age. Since New Mexico initiated a targeted immunization program for hepatitis A in counties with historically high rates, rates have dropped dramatically.

References


What is hepatitis A?
Hepatitis A is a liver disease caused by the hepatitis A virus (HAV.)

What are the symptoms of hepatitis A infection?
Symptoms may include tiredness, poor appetite, fever and nausea. Urine may become darker in color. A person may develop jaundice (a yellowing of the skin and the whites of the eyes). The symptoms may appear 2 to 6 weeks after exposure, but usually within four weeks. Infants and young children generally have very mild symptoms and are less likely to develop jaundice than are older children and adults. Not everyone who is infected will have all of the symptoms. The disease is rarely fatal, and most persons recover in a few weeks without any complications.

How is hepatitis A spread?
The hepatitis A virus enters through the mouth, multiplies in the body, and is passed in the feces (stool). The virus can then be carried on an infected person's hands and can be spread by direct contact, or by consuming food or drink that has been handled by the infected individual. In some cases, it can be spread by sexual contact or by consuming water or food (e.g., raw shellfish, vegetables) "dirtied" or contaminated by sewage.

How long are people contagious?
The contagious period begins about two weeks before the symptoms appear. Most people are probably no longer contagious after the first week of jaundice. An individual who has recovered from hepatitis A is immune for life and does not continue to carry the virus.

Who gets hepatitis A?
Anyone who has not been previously exposed to HAV or is not immunized can become infected and ill from the hepatitis A virus. Antibodies produced during a previous infection with HAV, or in response to immunization for HAV, protect against infection.

What treatment is available for people with hepatitis A?
There are no special medicines that can be used to treat a person once the symptoms appear. Generally, bed rest is all that is needed for persons to recover from hepatitis A.

Do infected people need to be kept home from school, work or daycare?
Food handlers and day care attendees and workers should be kept home from work until one week after the onset of jaundice or if no jaundice then 14 days after the first appearance of other symptoms.

How can I protect myself and my family from getting hepatitis A?
You can decrease your chance of coming in contact with hepatitis A by the following practices:
• Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
• Promptly disinfect contaminated surfaces with household chlorine bleach-based cleaners.
• Avoid food or water from sources that may be contaminated.
• Obtain the hepatitis A vaccine. Individuals may wish to discuss the potential benefits of receiving the hepatitis A vaccine with their doctor.
• Household members or others in close contact with an infected person should call a doctor or the health department to determine if they should obtain a shot of immune globulin (IG) or hepatitis A vaccine which minimizes their chances of becoming ill.
¿Qué es la hepatitis A?
La hepatitis A es una enfermedad del hígado causada por el virus de la hepatitis A (VHA).

¿Cuáles son los síntomas de la hepatitis A?
Los síntomas incluyen cansancio, pérdida de apetito, fiebre y náuseas. La orina se puede volver más oscura. La persona infectada puede desarrollar ictericia (piel y ojos amarillentos). Los síntomas pueden aparecer entre 2 y 6 semanas después de haber estado expuesto, pero normalmente aparecen a las 4 semanas. Los bebés y los niños pequeños tienen síntomas leves y posiblemente no tengan ictericia, ésta es más probable en niños mayores o adultos. No todos los que tienen la infección presentan todos los síntomas. Esta enfermedad rara vez es mortal y la mayoría se recupera en unas semanas sin ninguna complicación.

¿Cómo se transmite la hepatitis A?
El virus de la hepatitis A entra por la boca, se multiplica en el cuerpo y se expulsa en las heces. Si una persona toca las heces infectadas, entonces el virus pasa a las manos y se puede transmitir por contacto directo o si se consume bebida o comida que esta persona ha manipulado. En algunos casos, se puede transmitir por contacto sexual o si se consume agua o comida (como mariscos o verduras sin cocinar) contaminadas por desechos residuales o aguas negras.

¿Por cuánto tiempo puede alguien con hepatitis A contagiar a otros?
Se puede contagiar a otros a partir de dos semanas después de que hayan aparecido los síntomas. Muchas personas dejan de ser contagiosas después de haber tenido ictericia (piel y ojos amarillentos) por una semana. Una persona que ya pasó la enfermedad adquiere inmunidad para toda la vida, no volverá a pasar la enfermedad y ya no es portador del virus.

¿Quién puede contraer hepatitis A?
Cualquier persona que no estuvo expuesta al virus (VHA) o que no recibió la vacuna puede contraer una infección causada por el virus de la hepatitis A. Las personas que ya pasaron la enfermedad o recibieron la vacuna tienen anticuerpos que les protegen contra esta infección.

¿Cómo se trata la hepatitis A?
No hay medicinas especiales que se puedan usar para tratar a una persona cuando aparecen los síntomas. Normalmente, reposo en cama es todo lo que se necesita para recuperarse.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Los que trabajan en guarderías o asisten a ellas, y también los que trabajan manipulando alimentos, deben quedarse en casa al menos durante una semana desde la aparición la ictericia (piel y ojos amarillentos) y si no tienen ictericia, entonces por 14 días desde la aparición de otros síntomas.

¿Cómo puedo protegerme yo y proteger a mi familia contra la hepatitis A?
Para disminuir sus posibilidades de contraer la hepatitis A, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Desinfecte pronto las superficies contaminadas con un limpiador para la casa que contenga blanqueador de cloro.
- Evite agua y comida que puedan provenir de fuentes contaminadas.
- Póngase la vacuna de la hepatitis A. Hable con su médico sobre los posibles beneficios de recibir la vacuna contra la hepatitis A.
- Todas las personas de un mismo hogar u otras personas en contacto cercano una persona infectada, deben llamar a un médico o al departamento de salud para determinar si deben recibir la inmunoglobulina, una preparación que sirve como forma de protección a corto plazo contra la hepatitis, o vacuna contra la hepatitis A.
Hepatitis B

Summary
Hepatitis B is a liver infection caused by the Hepatitis B virus (HBV). Hepatitis B is transmitted when blood, semen, or another body fluid from a person infected with the Hepatitis B virus enters the body of someone who is not infected. Hepatitis B virus (HBV) causes acute, chronic hepatitis B infection and perinatal hepatitis B (Acquired in the United States or U.S. Territories)

Agent
Hepatitis B virus (HBV) is a DNA containing, 42-nm-diameter hepadnavirus. Main component of viral particle is an outer lipoprotein envelope containing HBsAg and an inner nucleocapsid consisting of hepatitis B core antigen (anti-HBc). HBV can survive outside the body at least 7 days.

Transmission
Reservoir:
Humans, Chimpanzees are susceptible, however an animal reservoir in nature has not been recognized.

Mode of Transmission:
- HBV is transmitted through activities that involve percutaneous (i.e., puncture through the skin) or mucosal contact with infectious blood or body fluids (e.g., semen, saliva), including,
- Sex with an infected partner.
- Injection drug use that involves sharing needles, syringes, or drug-preparation equipment.
- Birth to an infected mother.
- Contact with blood or open sores of an infected person.
- Needle sticks or sharp instrument exposures.
- Sharing items such as razors or toothbrushes with an infected person.

Period of communicability:
All persons who are HBsAg-positive are potentially infectious. The infectivity of chronically infected individuals varies from high (HBeAg-positive, HBV-DNA above $10^5$ copies/ml) to modest (anti-HBe-positive).

Clinical Disease:

Incubation period:
An average of 90 days (range: 60–150 days) after exposure to HBV.

Illness:
Acute infection ranges from asymptomatic or mild disease to — rarely — fulminant hepatitis. Symptoms includes fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain and jaundice. Symptoms typically last for several weeks but can persist for up to 6 months. Majority of chronic Hepatitis B remain asymptomatic until onset of cirrhosis or end-stage liver disease.
Diagnosis
Clinical Criteria:

Acute Hepatitis B:
An acute illness with a discrete onset of any sign or symptom* consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) levels >100 IU/L.

* A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test (either HBsAg, hepatitis B "e" antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does not require an acute clinical presentation to meet the surveillance case definition.

Chronic Hepatitis B:
No symptoms are required. Persons with chronic hepatitis B virus (HBV) infection may have no evidence of liver disease or may have a spectrum of disease ranging from chronic hepatitis to cirrhosis or liver cancer.

Perinatal hepatitis B:
Perinatal HBV infection in a child ≤ 24 month of age may range from asymptomatic to fulminant hepatitis.

Treatment
For acute infection, no medication is available; treatment is supportive.

There are several antiviral medications for persons with chronic infection. Persons with chronic HBV infection require linkage to care with regular monitoring to prevent liver damage and/or hepatocellular carcinoma.

Surveillance

Laboratory criteria –

Acute Hepatitis B:
• HBsAg positive, AND
• Immunoglobulin M (IgM) antibody to hepatitis B core antigen (IgM anti-HBc) positive (if done)

Confirmed Acute Hepatitis B:
A case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis B.

Chronic Hepatitis B:
• Immunoglobulin M (IgM) antibodies to hepatitis B core antigen (IgM anti-HBc) negative AND a positive result on one of the following tests: hepatitis B surface antigen (HBsAg), hepatitis B e antigen (HBeAg), or nucleic acid test for hepatitis B virus DNA (including qualitative, quantitative and genotype testing), or
HBsAg positive or nucleic acid test for HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive two times at least 6 months apart (Any combination of these tests performed 6 months apart is acceptable)

Probable Chronic Hepatitis B:
A person with a single HBsAg positive or HBV DNA positive (including qualitative, quantitative and genotype testing) or HBeAg positive lab result and does not meet the case definition for acute hepatitis B.

Confirmed Chronic Hepatitis B:
A person who meets either of the above laboratory criteria for diagnosis.

Perinatal Hepatitis B:
- Positive hepatitis B surface antigen (HBsAg) test (only if at least 4 weeks after last dose of Hep B vaccine).
- Positive hepatitis B e antigen (HBeAg) test.
- Detectable HBV DNA

Epidemiologic Linkage; Born to a HBV-infected mother.

Probable Perinatal Hepatitis B:
Child born in the US and positive for HBsAg at ≥ 1 month of age and ≤ 24 months of age OR positive for HBeAg or HBV DNA ≥9 months of age and ≤ 24 months of age, but whose mother’s hepatitis B status is unknown (i.e. epidemiologic linkage not present).

Confirmed Perinatal Hepatitis B:
Child born in the US to a HBV-infected mother and positive for HBsAg at ≥ 1 month of age and ≤ 24 months of age OR positive for HBeAg or HBV DNA ≥9 months of age and ≤ 24 months of age.

Reporting:
Report all suspected or confirmed cases of botulism immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. ERD will collect clinical and laboratory information, assist in the shipment of antitoxin for treatment, and arrange for specimen testing at CDC. Information should also be entered into NM-EDSS per established procedures.

Case Investigation:
When 2 or more cases occur in association with some common exposure, search for additional cases. Institute strict aseptic techniques. If a plasma derivative such as antihemophilic factor, fibrinogen, pooled plasma or thrombin is implicated, withdraw the lot from use and trace all recipients of the same lot in a search for additional cases.

Control Measures
1. Case management
   b. Isolation: universal precautions to prevent exposure to blood and body fluids.
   c. Concurrent disinfection: Of equipment contaminated with blood or infectious body fluids.
d. Quarantine: Not applicable.

e. No specific treatment available for Acute Hepatitis B. Treatment is supportive.

2. Contact management

Immunization of contacts with hepatitis B vaccine and when indicated HBIG as soon as possible.

Further guidance on post-exposure prophylaxis Hepatitis B can be found at https://www.cdc.gov/hepatitis/hbv/pep.htm

3. Prevention

3.1. Preventing perinatal HBV transmission by screening all pregnant women for HBsAg and providing immune-prophylaxis to infants of HBV-infected women;

3.2. routine immunization of all infants;

3.3. vaccinate of all previously unvaccinated children aged <19 years, with priority for vaccination at 11 to 12 years of age;

3.4. vaccination of adolescents and adults at high risk for infection including persons with a history of multiple sex partners or a sexually-transmitted disease; men who have sex with men; injecting drug users; incarcerated persons; household and sex contacts of persons with chronic HBV infection; health care and public safety workers who have exposure to blood in the workplace; and hemodialysis patients.

4. Outbreak

Outbreak Definition: The occurrence of ≥ 2 cases of Hepatitis B in association with a common exposure is considered an outbreak.

Notify Epidemiology and Response Division (ERD) immediately at 505-827-0006.

Further guidance on investigating Hepatitis B outbreaks cases that are suspected to be related to healthcare delivery can be found at: www.cdc.gov/hepatitis/Outbreaks/index.htm

Management of Hepatitis B in Child Care Centers

Persons should not be excluded from child care centers.

References


Centers for Disease Control and Prevention (CDC) 2016. Case Definitions. available at www.cdc.gov/nndss/


Centers for Disease Control and Prevention (CDC) 2015 Hepatitis b information. available at https://www.cdc.gov/hepatitis/hbv/index.htm

Centers for Disease Control and Prevention (CDC) 2016 Hepatitis B FAQs for Health Professionals. available at https://www.cdc.gov/hepatitis/hbv/hbvfaq.htm#treatment

What is Hepatitis B? Hepatitis B is caused by a DNA Virus known as *Hepatitis B virus* (*HBV*).

What are the symptoms of Hepatitis B? Fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, jaundice.

Persons with chronic HBV infection might be asymptomatic.

How is Hepatitis B spread? HBV is transmitted through activities that involve percutaneous (i.e., puncture through the skin) or mucosal contact with infectious blood or body fluids (e.g., semen, saliva). HBV is not spread through food or water, sharing eating utensils, breastfeeding, hugging, kissing, hand holding, coughing, or sneezing.

How long are people contagious? Persons can spread the HBV virus as long as it is present in their blood.

Who gets Hepatitis B?
- Infants born to infected mothers.
- Sex partners of infected persons.
- Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., >1 sex partner during the previous 6 months).
- Men who have sex with men.
- Injection drug users.
- Household contacts of persons with chronic HBV infection.
- Health care and public safety workers at risk for occupational exposure to blood or blood-contaminated body fluids.
- Hemodialysis patients.
- Residents and staff of facilities for developmentally disabled persons.
- Travelers to countries with intermediate or high prevalence of HBV infection.

What treatment is available for people with Hepatitis B? For acute infection, no medication is available; treatment is supportive. There are several antiviral medications for persons with chronic infection.

Do infected people need to be kept home from school, work or daycare? NO.

How can I protect myself and my family from getting Hepatitis B? The best way to prevent hepatitis B is vaccination. Other ways are:
- Do not inject drugs.
- Do not share personal care items that might have blood on them (razors, toothbrushes)
- Follow universal blood/body fluid precautions and safely handle needles and other sharps objects in health care setting.
- Avoid unprofessional tattooing, body piercing, or acupuncture.
- Practice safe sex using latex condoms correctly.
¿Qué es la hepatitis B? La hepatitis B es causada por un virus de ADN conocido como el virus de la Hepatitis B (VHB).


¿Cómo se transmite la hepatitis B? El VHB se transmite a través de actividades que involucran contacto percutáneo (por ejemplo: roturas en la piel) o mucoso con sangre o fluidos corporales infectados (por ejemplo: semen o saliva). El VHB no es transmisible por la comida o el agua, al compartir utensilios, al amamantar, en un abrazo, con un beso, al estrechar manos, al toser, o al estornudar.

¿Por cuánto tiempo puede alguien con hepatitis B contagiar a otros? Las personas pueden transmitir el VHB mientras esté presente en su sangre.

¿Quién puede contraer hepatitis B?
- Bebes nacidos de madres infectadas.
- Parejas sexuales de personas infectadas.
- Personas sexualmente activas que no están en una relación mutuamente monógama de largo plazo (por ejemplo: >1 pareja sexual durante los 6 meses previos).
- Hombres que tienen sexo con otros hombres.
- Personas que se inyectan drogas.
- Contactos hogareños de personas con infecciones crónicas de VHB.
- Trabajadores del área de salud o seguridad publica en riesgo de exponerse a sangre o fluidos corporales contaminados con sangre a través de su trabajo.
- Pacientes de hemodiálisis.
- Personas que residen o trabajan en sitios de cuidado a personas con problemas de desarrollo.
- Personas que viajan a países con prevalencia intermedia o alta de infecciones con VHB.

¿Cómo se trata la hepatitis B? No existen medicinas para tratar la infección aguda; el tratamiento es de soporte. Existen varias medicinas antivirales para personas con infecciones crónicas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo? No

¿Cómo puedo protegerme yo y también proteger a mi familia contra la hepatitis B? La mejor manera de prevenir la hepatitis B es vacunándose. Otras formas incluyen:
- No inyectarse drogas.
- No compartir artículos de cuidado personal que puedan tener sangre en ellos (navajas, cepillos de dientes)
- Seguir las precauciones universales para tratar con sangre/fluidos sanguíneos y manejar con cuidado agujas y otros objetos punzantes en las clínicas u hospitales.
- Evite tatuarse, hacerse un piercing, o hacerse acupuntura con alguien que no sea profesional.
- Practique el sexo seguro usando condones de látex de manera correcta.
Hepatitis C

Summary

Hepatitis C is a contagious liver disease that ranges in severity from a mild illness lasting a few weeks to a serious, lifelong illness that attacks the liver.

Hepatitis C virus (HCV) causes both acute and chronic infection. Acute HCV infection is usually asymptomatic and is only very rarely (if ever) associated with life-threatening disease. About 15–45% of infected persons spontaneously clear the virus within 6 months of infection without any treatment.

The remaining 55–85% of persons will develop chronic HCV infection. Of those with chronic HCV infection, the risk of cirrhosis of the liver is between 15–30% within 20 years.

Agent

Hepatitis C virus (HCV) is an enveloped, single-stranded RNA virus which appears to be distantly related to Flaviviruses.

At least six distinct HCV genotypes (genotypes 1–6) and more than 50 subtypes have been identified. Genotype 1 is the most common HCV genotype in the United States.

Transmission

Reservoir:

Humans. Virus has been transmitted experimentally to chimpanzees.

Modes of transmission:

- Injection drug use (most common means of HCV transmission)
- Receipt of donated blood, blood products, and organs
- Needle stick injuries in health care settings
- Birth to an HCV-infected mother

Less commonly, a person can also get Hepatitis C virus infection through:

- Sharing personal care items, such as razors or toothbrushes
- Having sexual contact with a person infected with HCV

Period of communicability:

From one or more weeks before onset of the first symptoms; may persist in most persons indefinitely. Peaks in virus concentration appear to correlate with peaks in ALT activity.

Clinical Disease

Incubation period:

Average 6–7 weeks; range 2 weeks to 6 months.

Illness:

Onset is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting; progresses to jaundice less frequently than hepatitis B. Initial infection may be asymptomatic (more than 90% of cases) or mild. About 50% - 80% develop chronic
infection out of which 60% - 70% develop chronic liver disease and 1% - 5% develop liver cancer.

**Diagnosis**

Clinical criteria:

An illness with discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain); and

(a) jaundice, or

(b) a peak elevated serum alanine aminotransferase (ALT) level >200 IU/L during the period of acute illness.

**Treatment**

For acute infection, no medication is available; treatment is supportive.

There are several antiviral medications for treating persons with chronic infection. For example, ledipasvir, sofosbuvir, simeprevir, paritaprevir, ritonavir and ombitasvir. Regimens for treatment and response to treatment depend upon the genotype with which the person is infected and complications of the disease. Persons with chronic HBV infection require linkage to care with regular monitoring to prevent liver damage and/or hepatocellular carcinoma. The complete guidance, which is updated regularly, is available at [www.hcvguidelines.org](http://www.hcvguidelines.org).

**Surveillance**

**Laboratory criteria:**

**Confirmed** –

Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative or genotype testing)

A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen) when and if a test for HCV antigen(s) is approved by FDA and available. **Probable** –

A positive test for antibodies to hepatitis C virus (anti-HCV).

**Case Definition:**

**Confirmed** –

- A case that meets clinical criteria and has a positive hepatitis C virus detection test (HCV NAT or HCV antigen), OR
- A documented negative HCV antibody, HCV antigen or NAT laboratory test results followed within 12 months by a positive result of any of these tests.

**Probable** –

- A case that meets clinical criteria and has a positive anti-HCV antibody test, but has no reports of a positive HCV NAT or positive HCV antigen tests, AND
- Does not have test conversion within 12 months or has no report of test conversion.

**Reporting:**
Report all suspected or confirmed cases of Hepatitis C within 24 hours to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. ERD will collect clinical and laboratory information, assist in the shipment of antitoxin for treatment, and arrange for specimen testing at CDC. Information should also be entered into NM-EDSS per established procedures.

Case Investigation:

1) Create a contact listing and follow-up with the listed contacts.

2) Provide education on avoiding further exposures and to ensure proper medical care is obtained and precautions taken if symptoms develop.

3) Children born to HCV positive mothers should be tested, as follows:
   - HCV RNA at 1-2 months of age or
   - Anti-HCV at 18 months of age.

4) For additional guidance on persons for whom HCV testing is recommended, refer to the CDC’s Recommendations for Prevention and Control of HCV Infection and HCV-Related Chronic Disease (MMWR 1998;47(RR-19): [pp. 20-30])

5) Report the final disposition of each contact investigated.

Control Measures

1. Case management
   1.1. Isolation: None.
   1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. No prophylaxis available for contacts; refer at-risk contacts for medical evaluation and follow-up.

3. Prevention:
   3.1. Vaccination: Currently, no effective HCV vaccine or post-exposure prophylaxis is available.
   3.2. Primary prevention includes activities to reduce the risk of contracting the infection. Household members of HCV infected individuals ….should we refer staff to fact sheet or put control measures for blood borne infections here.
   3.3. Secondary prevention includes, activities to reduce the risk of liver disease and other HCV-related chronic diseases among HCV-infected persons.
      3.3.a HAV vaccination
      3.3.b HBV vaccination

4. Outbreak
   1. Outbreak Definition: The occurrence of ≥ 2 cases of hepatitis C in association with a common exposure is considered an outbreak.
      a. Notify Epidemiology and Response Division (ERD) immediately at 505-827-0006.
Further guidance on investigating outbreaks including hepatitis B cases that are suspected to be related to healthcare delivery can be found at: www.cdc.gov/hepatitis/Outbreaks/index.htm.

References


HEPATITIS C

What is Hepatitis C? Hepatitis C is inflammation of the liver caused by an enveloped single-stranded RNA virus, known as hepatitis C virus (HCV)

What are the symptoms of Hepatitis C?
Fever, fatigue, dark urine, clay-colored stool, abdominal pain, loss of appetite, nausea, vomiting, joint pain, jaundice

How is Hepatitis C spread? Hepatitis C virus is not spread by casual contact. This virus is found in blood. It is spread through contact with infected blood, such as shared needles used for injection drug use or a needle stick injury. The risk of sexual transmission of HCV is believed to be very low.

How long are people contagious? Persons can spread the virus as long as it is present in their blood.

Who gets Hepatitis C? Anyone can get hepatitis C, but those at higher risk include:
- drug users who share needles
- health care workers who have contact with infected blood
- patients receiving hemodialysis
- persons who have had a blood transfusion or organ transplant before 1992

What treatment is available for people with Hepatitis C? Several antiviral drugs are available to treat hepatitis C infection. Persons with hepatitis C infection should see a health care provider for medical evaluation and to discuss treatment options. Avoid alcohol. If not already immune, persons with hepatitis C should be vaccinated to prevent hepatitis A and hepatitis B.

Do infected people need to be kept home from school, work or daycare? No

How can I protect myself and my family from getting Hepatitis C?
- Do not inject drugs.
- Don’t share razors or toothbrushes, or needles used for injecting drugs.
- Avoid unprofessional tattooing or body piercing.
- Avoid contact with blood (wear gloves when touching blood and clean up spilled blood with bleach)
- Do not have unprotected sex
- If you are infected with HCV, do not donate blood
¿Qué es la hepatitis C? La hepatitis C es una enfermedad del hígado causada por un virus encapsulado de ARN de hebra simple, conocido como el virus de la hepatitis C (VHC).

¿Cuáles son los síntomas de la hepatitis C? Fiebre, cansancio. Pérdida del apetito, náuseas, vómitos, dolor abdominal, orina oscura, heces de color arcilla, dolor en las articulaciones, ictericia (coloración amarilla de la piel).

¿Cómo se transmite la hepatitis C? El virus de la hepatitis C no se transmite por contacto casual. Este virus se encuentra en la sangre. Se transmite a través del contacto con sangre infectada, puede ser por compartir agujas usadas para inyectarse drogas o a través de una exposición a agujas infectadas accidental. Se piensa que el riesgo de transmisión del VHC por contacto sexual es muy bajo.

¿Por cuánto tiempo puede alguien con hepatitis C contagiar a otros? Las personas pueden transmitir el VHC mientras esté presente en su sangre.

¿Quién puede contraer hepatitis C? Cualquiera puede contraer la hepatitis C, pero el riesgo es mayor en:

- Personas que se inyectan drogas.
- Trabajadores del área de salud que tienen contacto con sangre infectada.
- Pacientes de hemodiálisis.
- Personas que han tenido una transfusión sanguínea o un trasplante de órgano antes de 1992.

¿Cómo se trata la hepatitis C? Existen varias medicinas antivirales para tratar a las personas con hepatitis C. Las personas infectadas con hepatitis C deben evaluarse con un médico y discutir sus opciones de tratamiento. Evitar el alcohol. Las personas con hepatitis C que aún no tengan inmunidad a la hepatitis A y B deben ser vacunadas para prevenir estas enfermedades.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo? No

¿Cómo puedo protegerme yo y también proteger a mi familia contra la hepatitis C? La mejor manera de prevenir la hepatitis C es vacunándose. Otras formas incluyen:

- No inyectarse drogas.
- No compartir navajas de afeitar, cepillos de dientes, o agujas para inyectarse drogas.
- Evite tatuarse o hacerse un piercing con alguien que no sea profesional.
- Evite el contacto con sangre (use guantes siempre que tenga que tocar sangre y limpie derrames de sangre con cloro).
- No tenga sexo sin protección.
- Si usted está infectado con el VHC, no donar sangre.
Influenza

Summary
Influenza is an acute viral disease of the respiratory tract characterized by the sudden onset, fever often accompanied by sore throat, chills, headache, myalgias, rhinitis, nasal congestion and/or a dry cough. Conjunctival infection, abdominal pain, nausea, vomiting, and diarrhea are less commonly associated with influenza illness. In some children, influenza can have an atypical presentation of upper respiratory tract infection or as fever with few other respiratory tract symptoms. In infants, influenza can sometimes produce a sepsis-like picture and can cause other infections like pneumonia. Infections are acquired primarily by droplet spread from other infected persons after coughing or sneezing or by direct contact with contaminated surfaces leading to autoinoculation. Laboratory diagnosis is made by viral culture, antigen testing and/or polymerase chain reaction (PCR) of nasal, nasopharyngeal or throat swabs, or nasal washings. Serology should only be used retrospectively as it requires acute and convalescent specimens collected 14-days apart. Antiviral treatment is most commonly prescribed for high-risk patients, hospitalized patients with influenza, and any person presenting with severe, progressive illness. Antivirals, as prophylaxis, should be considered for non-immunized persons in special situations or groups at high risk of complications from influenza. Antiviral administration should not depend solely on lab confirmation and should be initiated as soon as possible after illness onset since the clinical benefit is greatest when administered early. However, antiviral treatment may still be beneficial in patients with severe, complicated, or progressive illness, in hospitalized patients, and in high-risk outpatients when started after 48 hours of illness onset, as indicated by clinical and observational studies. Antivirals do decrease shedding time and should be considered in all persons with influenza-like illness. Annual influenza vaccination is considered to be the most effective way to prevent disease, serious illness or complications in many patients.

Agent
Four types of influenza virus are currently recognized: A, B, C, and D. Influenza A, B, and C are the only types known to infect humans and cause illness. Influenza A and B are the only types that are tied to seasonal epidemics and outbreaks. Influenza A is the only type currently capable of causing pandemics.

Influenza A viruses are subclassified by two surface antigens: hemagglutinin (H, H1-H18) and neuraminidase (N, N1-N11). Minor antigenic variations within the circulating strains occur continuously and cause seasonal epidemics, this is a process referred to as antigenic "drift". Antigenic "shift" is a major change in the circulating influenza virus that results in a new subtype and can lead to a pandemic if there is sustained human to human transmission. The implications of these genetic mutations are explained in more detail below.

Transmission
Reservoir:
Humans are the primary reservoir for human influenza A viruses. Other reservoirs have been identified such as swine and birds and may be potential sources of new influenza A subtypes which can be pathogenic to humans and emerge through genetic re-assortment.

Mode of transmission:
Influenza viruses are primarily spread via droplets from infected persons who are coughing and/or sneezing, talking or by direct contact with virus-contaminated surfaces.

Period of communicability:

Adults can be infectious generally from one day prior to onset of symptoms and up to seven days after onset.

Clinical Disease

Incubation period:

Usually 1-4 days (with a mean of two days).

Illness:

The illness is characterized by the sudden onset of fever, with any or all of the following: sore throat, headache, myalgias, coryza (inflammation of the mucus membrane in the nose), and non-productive cough. Influenza may be indistinguishable from many other upper respiratory viral illnesses and should be confirmed with laboratory tests. The clinical picture may range from the common cold, croup, bronchiolitis, or viral pneumonia, to undifferentiated acute respiratory disease. Gastrointestinal manifestations (nausea, vomiting, or diarrhea) are uncommon, but may accompany the respiratory phase, particularly in children.

Laboratory Diagnosis

The diagnosis of influenza is often made on clinical grounds especially during influenza season which runs approximately from October through May. If done, testing ideally should be performed within the initial 72-hours of symptom onset.

Diagnosis can be confirmed by:

- Reverse transcriptase-polymerase chain reaction (RT-PCR) testing of nasal or throat swabs available at NMDOH Scientific Laboratory Division (SLD) and commercial labs. RT-PCR testing offers improved sensitivity and specificity and test results are available to the submitter usually within 2 to 3 business days.
- Viral culture of nasopharyngeal swab, nasal or throat washings is considered the “gold standard” testing method but turnaround time for results is usually 2-6 days.
- Immunofluorescence or direct fluorescent antibody (DFA) staining results are available within 2-4 hours and done in a lab setting. This testing method has acceptable sensitivity and specificity standards but requires specifically trained laboratory staff for interpretation.
- Rapid Influenza Diagnostic Test (RIDTs) provides more immediate results and can be done at the point of care. The sensitivity (45-90%) and specificity (60-90%) of these tests varies depending on the prevalence of influenza in the community and the specific tests used.
- Serological testing is rarely useful for patient management as two titers collected 10-14 days apart are required.

Treatment

Individual’s sick with influenza should be advised to stay home and avoid contact with other people. Influenza is typically treated with rest, liquids, and antipyretic medications. Salicylates (i.e., aspirin) should be avoided because of the risk of Reye’s syndrome.
Antiviral medications are usually reserved for treatment of high-risk patients (e.g., individuals with chronic cardiac, pulmonary, renal, or endocrine disorders; patients on immunosuppression; children under two years; adults ≥65 years old; pregnant women; persons <19 years old on chronic aspirin therapy; American Indians; persons with morbid obesity; and, residents of nursing homes and other chronic care facilities). Other situations (e.g., non-immunized exposed persons or groups at high-risk for complications) may also warrant antiviral medical use for prophylaxis.

- The neuraminidase inhibitors (zanamivir and oseltamivir) have been shown to be effective for treatment of both influenza A and B. The other class of antiviral medication for influenza is the adamantanes (amantidine and rimantidine). Current circulating influenza A and influenza B viruses are resistant to adamantanes.
- Oseltamivir is FDA-approved for treatment in persons aged two weeks of age and older.
- Zanamivir is approved for treatment in persons 7 years and older.
- Treatment started within 48 hours of onset of illness and given for 5 days reduces symptoms by one day and may reduce viral shedding.

Secondary complications such as bronchitis and pneumonia or more invasive secondary bacterial infections with respiratory tract pathogens may complicate influenza illness leading to severe disease or death, especially in high-risk populations. These secondary complications require specific antibiotic therapy as directed by the patient's health care provider.

**Surveillance**

Case Definition:

A formal case definition has not been established for influenza. However, for surveillance purposes influenza-like illness (ILI) is defined as fever (temperature of 100°F or more [37.8°C] or more), and a cough, and/or a sore throat in the absence of a diagnosis other than influenza.

Reporting:

Report all 1) laboratory confirmed cases of influenza, 2) human infection with novel influenza strains confirmed by laboratory testing, and 3) pediatric influenza-related deaths 4) ILI involving large number of people in the same geographic area (outbreaks) to the Epidemiology and Response Division (ERD) at 505-827-0006.

**Control Measures**

1. Case management
   - Isolation: Patients with influenza should be cared for at home when possible unless hospitalization is warranted. In addition to standard precautions, droplet precautions are required for persons hospitalized with influenza or an influenza-like illness for the duration of illness.

2. Contact management
   - Isolation: None required.
   - Prophylaxis:
i. Antiviral medications are useful adjuncts to influenza vaccine for the prevention of influenza A or B in high-risk patients, non-immunized persons, or groups at high risk for complications, such as residents of institutions, nursing homes, or correctional facilities. The antiviral medication needs to be continued until full immunologic response to the vaccine has been achieved (i.e., two weeks), or throughout the epidemic for unimmunized or immunodeficient persons.

c. Oseltamivir and zanamivir can be used for prophylaxis against both influenza type A and B. Oseltamivir is approved for prophylactic use in persons ≥1 year; zanamivir for use in persons aged ≥5 years.

Guidelines on the indications for, and the dosing of, antiviral therapy for treatment and chemoprophylaxis are updated periodically. Current guidelines are available at:

http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

3. Prevention

1.1. Immunization: Routine annual administration of influenza vaccine is a universal recommendation for all persons six months of age and older. High-risk persons as well as health care personnel are especially targeted groups. Vaccination is the most beneficial means of reducing influenza burden in those who are at the greatest risk of serious complications from influenza. The vaccine is available in both inactivated trivalent and quadrivalent injection(s). Recommendations for the administration of live attenuated nasal spray vaccinations should be checked annually as 2016-2017 recommendations did not support the administration of this vaccination method due to low effectiveness. This information can be accessed here: https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm. Currently, there is no evidence to support the administration of a second dose of influenza vaccine to adults who have already received their annual seasonal vaccination.

1.2. Influenza vaccination and special populations: Fluzone High-Dose Seasonal Influenza vaccine is licensed specifically for persons ≥65 years of age; contains 4 times the amount of antigen as the regular flu shot. It is intended to give older people a better immune response following vaccination. Children 6 months through 8 years: Some children 6 months through 8 years require two doses of influenza vaccine. The first should be given as soon as the vaccine becomes available and the second at least 28 days later. Management of Influenza in Child Care Centers

1. All children six months of age and older and especially children who are at high risk for serious disease from influenza should be vaccinated.

2. If a child or staff person develops fever and chills, sore throat, headache, or muscle aches suggestive of influenza, s/he should be sent home until 24 hours after cessation of fever without use of antipyretics.

Management of Influenza in Long-term Care Facilities or other Institutional Settings

Please consult with the New Mexico Department of Health epidemiologist on call (505-827-0006) to report any cases of influenza-like illness at semi-enclosed institutional settings such as nursing homes, rehabilitation centers, or correctional institutions for assistance with
testing to confirm influenza and recommendations for prevention and control of further illness.

Annually updated guidelines for the management of influenza in child care, schools, outpatient, acute care and long-term care settings can be accessed at the New Mexico Department of Health Influenza Website: [https://nmhealth.org/about/erd/idb/isp/](https://nmhealth.org/about/erd/idb/isp/)

**Pandemic Control Measures**

Influenza viruses mutate on a regular basis. Slight mutations within the same influenza B or influenza A subtypes occur almost every year resulting in “antigenic drift”. These small antigenic changes are the reason the influenza vaccine needs to be reformulated and administered every year.

Periodically, major antigenic changes occur in influenza A subtypes that are referred to as “antigenic shift”. The resulting new influenza A subtypes carry the potential to cause a pandemic when they demonstrate the ability to cause human illness and show efficient human-to-human transmission, in the background of little or no pre-existing immunity among the general population. These novel influenza viruses can result in global pandemics with morbidity and mortality exceeding baseline seasonal influenza levels. The most recent example was the 2009 Influenza A H1N1 pandemic that first appeared in April 2009 and caused increased morbidity and mortality worldwide throughout the 2009-2010 influenza season.

**References**


What is influenza?
Influenza, commonly known as "the flu," is a respiratory illness caused by a virus. There are two main types of influenza virus, A and B. Each type includes many different strains that tend to change each year.

What are the symptoms of influenza?
Symptoms usually appear 1 to 4 days after exposure. Influenza symptoms may include headache, fever, chills, cough, sore throat, and body aches. Most people do not have diarrhea and vomiting. Although most people are ill for less than a week, some people become seriously ill and may need to go to the hospital.

How is influenza spread?
Influenza may be spread through contact with mucus or droplets from the nose and throat of an infected person, especially when s/he coughs, sneezes, or talks.

How long are people contagious?
The contagious period varies, but adults can probably begin to spread the virus one day before symptoms appear and for a week after their symptoms first appear.

Who gets influenza disease?
Anyone can get the flu. However, in some persons it may be more serious. Groups of people who may become more seriously ill include the elderly, infants, people with chronic illnesses (such as lung disease, heart disease, cancer or diabetes), pregnant women, those with weakened immune systems, American Indians and Alaska Natives, and morbidly obese persons. Persons need to be vaccinated every year to protect themselves from influenza.

What treatment is available for people with influenza?
Rest, liquids, and over-the-counter medicine are the usual treatments. Those who may become more seriously ill from influenza should see a health care provider as soon as possible for antiviral medications as needed. Since the flu is caused by viruses, not by bacteria, antibiotics will not work to treat the patient. Aspirin should not be given to children with influenza because of the possibility of causing a complication called Reye’s syndrome.

Do infected people need to be kept home from school, work or daycare?
People who are sick should stay home until they feel well enough to return and have not had a fever for 24 hours.

How can I protect myself and my family from getting influenza?
- Everyone >6 months of age should receive the annual influenza vaccination.
- Wash hands frequently with water and soap. Teach children to wash their hands too. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Always cover your nose and mouth when you cough or sneeze and then wash your hands.
- In some situations, antiviral medications may be used to prevent or treat the flu - talk to your health care provider for more information.
- Avoid close contact with people who are sick.
- Encourage people who are sick to stay home.
¿Qué es la influenza?
La influenza se conoce con el nombre común de la “gripe” y no se debe confundir con un simple catarro o resfriado. Hay dos tipos fundamentales del virus de la influenza, tipo A y B. Cada tipo incluye muchas cepas (variedades) distintas que cambian cada año.

¿Cuáles son los síntomas de la influenza?
Los síntomas normalmente aparecen entre 1 y 4 días después de haber estado expuesto. Los síntomas pueden incluir dolor de cabeza, fiebre, escalofríos, tos, dolor de garganta y dolor en todo el cuerpo. La mayoría de las personas no tienen diarrea ni vómitos. Aunque muchos sólo están enfermos por menos de una semana, algunos pueden enfermarse de forma grave y puede ser que necesiten ir al hospital.

¿Cómo se transmite la influenza?
Se transmite por contacto con los mocos o las gotitas que se expulsan al aire cuando alguien infectado estornuda o tosa.

¿Por cuánto tiempo puede una persona con influenza contagiar a otros?
El periodo de contagio varía, pero lo más probable es que una persona infectada pueda contagiar a otros desde un día antes de que se presenten los síntomas hasta una semana después de que hayan aparecido.

¿Quién puede contraer la influenza?
Cualquiera puede contraerla. Sin embargo, puede ser más grave en: personas mayores de edad, bebés, personas con enfermedades crónicas (como enfermedades pulmonares o del corazón, cáncer o diabetes), mujeres embarazadas, o aquellos que tienen su sistema inmunológico debilitado, Indios-Americanos y nativos de Alaska, y personas que son extremadamente obesas. Para protegerse, puede vacunarse cada año.

¿Cómo se trata la influenza?
Normalmente para tratarla, descansar, tomar líquidos y medicinas sin receta médica para aliviar los síntomas. Hay algunas medicinas con receta médica que pueden prevenir o reducir la gravedad de la gripe. Los antibióticos no la curan. No se debe dar aspirina a niños con gripe (influenza) porque existe la posibilidad de que cause una complicación médica que se llama el síndrome de Reye.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas enfermas deben quedarse en casa hasta que se sientan bien para regresar y hasta que hayan estado sin fiebre por un día completo (24 horas).

¿Cómo puedo protegerme y proteger a mi familia contra la influenza?
- Todos mayores de 6 meses de edad deben vacunarse cada año.
- Lávese bien las manos con frecuencia con agua y jabón y enséñele a los niños a lavarse las manos también. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Siempre cúbrase la nariz y la boca al toser o estornudar y después lávese las manos.
- En algunos casos, se pueden usar medicamentos antiviricos para prevenir o tratar la gripe (influenza), hable con su médico para obtener más información.
- Evite el contacto directo con personas enfermas.
- Animar a las personas enfermas a quedarse en casa.
**Legionellosis**

**Summary**

Legionellosis is an acute bacterial disease with two distinct clinical and epidemiological manifestations: Legionnaires’ disease and Pontiac fever. It was first recognized following a 1976 outbreak of pneumonia involving delegates at an American Legion convention and was named in the media as ‘Legionnaires’ disease’. Pontiac fever was named during an outbreak in 1968 in Pontiac, Michigan and it occurs in people of all ages and is often identified during outbreaks. Legionnaires’ disease is a potentially fatal form of pneumonia and Pontiac fever is a self-limited ‘flu-like’ illness without pneumonia. Extrapulmonary *Legionella* has also been reported.

Legionellosis is seen most commonly in the elderly, immunocompromised, current and former smokers, and those with underlying lung disease such as emphysema. Infection in children is rare: it is usually unrecognized, asymptomatic or mild though severe disease has been seen in children with immunocompromising conditions and as healthcare-associated infection in newborns. Legionnaires’ disease also commonly affects those with hotel or cruise ship stay reported during the two weeks prior to illness.

**Agent**

*Legionella* are Gram-negative bacilli. In all, over 60 species and 74 serogroups have been recognized to date; *L. pneumophila* is responsible for >80% of infections. There are 18 serogroups of *L. pneumophila* are currently recognized; serogroup 1 causes much of the disease reported in the U.S. *Legionella* thrives in warm, aquatic environments and it is relatively resistant to the effects of chlorine and heat. *Legionella* grows in a variety of places such as soil and both man-made and natural water sources. They do not colonize the human respiratory tract.

**Transmission**

Reservoir:

Water is the primary reservoir. *Legionella* can survive for months in tap and distilled water. The optimal temperatures in which *Legionella* organisms can multiply in water are between 25 – 42 °C (77 - 108 °F) A variety of natural and man-made aqueous sources have been implicated, including warm, stagnant water such as that found in, or aerosolized from:

- Shower heads and faucets.
- Respiratory therapy equipment.
- Ultrasonic misters.
- Cooling towers, evaporative condensers, and fluid coolers using evaporation to reject heat. Domestic hot-water systems with water heaters that operate below 60°C (140°F) and deliver water to taps below 50°C (122°F.)
- Humidifiers and decorative fountains that create a water spray and use water at temperatures favorable to growth.
- Spas and whirlpools.
- Dental water lines which are frequently maintained at temperature above 20°C (68°F) and sometimes as warm as 37°C (98.6°F) for patient comfort.
Other sources including stagnant water in fire sprinkler systems and warm water for eye washes and safety showers.

Potting soil and potting compost have been associated with *L. longbeachae*, a serogroup uncommon in the US. Foreign travel may be associated with acquisition of infection.

**Mode of Transmission:**

*Legionella* is generally spread through the air by aerosolized water which is then inhaled or microaspirated. Infection has also occurred by contamination of surgical wounds with potable water.

**Period of Communicability:**

It is not transmitted from person to person.

**Clinical Disease**

**Incubation period:**

For Legionnaires’ disease, 2–10 days (usually 5–6 days); for Pontiac fever, 24–48 hours (can be as short as 4 hours).

**Illness:**

Legionnaires’ disease includes mild to severe pneumonia characterized initially by fever, cough, with or without chest pain, and progressive respiratory disease. Legionnaires disease can also be associated with chills, myalgia, and gastrointestinal, renal, and central nervous system manifestations. Respiratory failure and death can occur. Pontiac fever is a much milder syndrome—notable for the absence of pneumonia—and characterized by abrupt onset and a self-limited influenza-like illness. The influenza-like symptoms may include low-grade fever, headache, weakness, nausea, and a dry cough.

**Laboratory Diagnosis**

For diagnostic testing, a combination of both culture of a lower respiratory tract specimen (e.g., sputum, swab, or bronchial washing) and urine antigen test should be performed. Culture of respiratory secretions on buffered charcoal yeast extract agar (BCYE) is required to isolate *Legionella* sp. The urine antigen screen is the most used diagnostic test available and it detects the most common cause of Legionnaires’ disease, *L. pneumophila*, serogroup 1. The urine is positive for antigen on day one of illness and continues to be positive for weeks. Serologic tests are neither highly sensitive nor specific and should be interpreted with caution. A single acute serologic test is not sufficient to diagnose Legionnaires’ disease. See laboratory criteria for diagnosis below. A new PCR test (BD ProbeTec ET™) will detect *L. pneumophila* serotypes 1 through 14 in sputum. Although approved for use by the FDA, extensive published clinical experience using this test is lacking.

**Treatment**

For Legionnaires’ disease, initially intravenous azithromycin or levofloxacin followed by oral administration as the patient improves is recommended. Fluoroquinolones (e.g., levofloxacin) are the drugs of choice for immunocompromised patients. Alternative drugs for treatment are doxycycline and trimethoprim-sulfamethoxazole. Treatment is recommended for 5–10 days for azithromycin and 14–21 days for other drugs. Treatment duration is longer with immunocompromised patients. Most patients will require management in an intensive care unit. Delay in treatment is associated with increased mortality rates.
Pontiac fever requires no specific treatment. Antimicrobial treatment is not recommended because the disease is not from bacterial replication. The disease results from host inflammation.

**Surveillance**

Case Definition:

*Clinical Case Definition:*

Legionellosis is associated with two clinically and epidemiologically distinct illnesses:

- Legionnaires’ disease: Characterized by fever, myalgia, cough, and clinical or radiographic pneumonia.
- Pontiac fever: Milder illness with flu-like symptoms (low-grade fever, headache, tiredness) and absent of pneumonia.

*Laboratory Criteria:*

**Confirmed**

A clinically compatible case that meets at least one of the confirmatory laboratory criteria listed below:

- By culture isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
- By detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
- By seroconversion with fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.

**Suspected**

A clinically compatible case that meets at least one of the presumptive (suspected) laboratory criteria listed below:

- By seroconversion with fourfold or greater rise in antibody titer to specific species or serogroups of *Legionella* other than *L. pneumophila* serogroup 1 (e.g., *L. micdadei*, *L. pneumophila* serogroup 6).
- By seroconversion with fourfold or greater rise in antibody titer to multiple species of *Legionella* using pooled antigen and validated reagents.
- By the detection of specific *Legionella* antigen or staining of the organism in respiratory secretions, lung tissue, or pleural fluid by direct fluorescent antibody (DFA) staining, Immunohistochemistry (IHC), or other similar method, using validated reagents.
- By detection of *Legionella* species by a validated nucleic acid assay.

**Reporting:**

- Report all suspected or confirmed cases of legionellosis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.
• Travel-associated: a case that has a history of spending at least one night away from home, either in the same country of residence or abroad, in the ten days before onset of illness. These should be reported to CDC immediately.

Case Investigation:

• Complete the Legionella Case Form and fax the completed form to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

• If the case is associated with travel (within two weeks of illness onset) the case should be reported within 24 hours to travellegionella@cdc.gov

Control Measures

1. Case management
   1.1. Isolation: Standard precautions recommended.
   1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. Isolation: None required.
   2.2. Prophylaxis: Not applicable.

3. Prevention
   3.1. Monochloramine treatment of municipal water supplies has been associated with a decrease in health care-associated Legionnaires’ disease. Hospitals should maintain hot water at the highest temperature allowable by state regulations or codes (preferably 60 degrees Celsius (140 degrees Fahrenheit) or greater and maintain cold water temperatures at less than 20 degrees Celsius (68 degrees Fahrenheit) to minimize waterborne Legionella contamination.
   Appropriate biocides should be used to limit the growth of slime-forming organisms in cooling systems and the systems should be mechanically cleaned periodically. Tap water should not be used in respiratory therapy devices.

If there has been an identified outbreak of legionellosis, Occupational Safety and Health Administration (OSHA) requires that investigators “wear appropriate respiratory protection in the form of a half-face piece respirator equipped with a high-efficiency particulate absorption (HEPA) filter or a similar type of filter media capable of effectively collecting particles in the one micron size range during the examination of water systems if a significant potential exposure exists for high concentrations of contaminated aerosols.” (http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_7.html)

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) also have recommendations regarding Prevention of Legionellosis Associated with Building Water Systems.

The investigation should include searching for common exposures among cases and possible environmental sources of infection, including inquiry regarding the following sources of exposure in the past two weeks: a) receiving dental work b) inpatient or outpatient hospital stay c) travel on a cruise ship d) recent hotel stay e) whirlpool, hot tub or Jacuzzi use. CDC maintains information for travelers and decontamination of hot tubs on their Legionella webpage. If a cluster of legionellosis is suspected, confirmation and
investigation are warranted, as morbidity may be significant and mortality high (up to 30%), and reservoirs may be found and remediated.

References


What is legionellosis?
Legionellosis also called Legionnaires’ disease, is caused by the bacteria called *Legionella*. The bacteria were named in 1976 when many people attending an American Legion conference in Philadelphia developed pneumonia. These bacteria, which had not been discovered until the American Legion outbreak, were found to be the cause.

What are the symptoms of legionellosis?
Legionellosis commonly causes pneumonia. Symptoms include cough, chills, high fever, and possibly muscle aches and headaches. Symptoms usually begin 2 to 14 days after being infected with the bacteria. Chest x-rays will usually show pneumonia. Other tests are often done on sputum, blood and urine to help identify the cause of pneumonia and these are helpful in diagnosing legionellosis. Illness can be severe, and hospitalization is common.

*Pontiac fever* is a milder infection caused by the same bacteria. People with Pontiac fever will usually develop a fever that lasts for 2 to 5 days, along with headache and muscle aches, but no pneumonia. Symptoms go away without treatment and people recover completely.

How are *Legionella* bacteria spread?
The bacteria are found naturally in the environment, usually in water. The bacteria grow best in warm water environments found in hot tubs, water towers, and air-conditioning systems of large buildings. People become infected when they breathe in mist or vapor that has been contaminated with the bacteria. One example might be from breathing in the steam from a hot tub that has not been cleaned and maintained properly.

How long are people contagious?
The bacteria are not spread from person to person.

Who gets legionellosis?
The people at greatest risk of getting legionellosis are people 65 years and older and people with weak immune systems. These include people with chronic lung disease, cancer, diabetes, kidney failure, and people taking chemotherapy or drugs that can weaken the immune system.

What treatment is available for people with legionellosis?
Legionellosis is treated with antibiotics, usually given intravenously in a hospital.

It is not recommended to treat Pontiac fever with antibiotics because the disease results from host inflammation (not bacterial replication.)
¿Qué es la legionelosis?

La legionelosis, también conocida como la enfermedad del legionario, es una enfermedad causada por la bacteria *Legionella*. El nombre se le adjudicó a esta bacteria en 1976 cuando a mucha gente que participaba en una conferencia de Legionarios Americanos en Filadelfia se enfermó de neumonía. Se descubrió que estas bacterias, que no habían sido descubiertas antes del brote de neumonía de los Legionarios Americanos, fueron las causantes de la enfermedad.

¿Cuáles son los síntomas de la legionelosis?

La legionelosis casi siempre causa neumonía. Los síntomas incluyen tos, escalofríos, fiebre alta y posiblemente dolores musculares y de cabeza. Los síntomas normalmente comienzan de 2 a 14 días luego de infectarse con la bacteria. Si se hacen rayos-X éstos normalmente muestran que hay neumonía. Con frecuencia se realizan otras pruebas, también útiles en el diagnóstico de la legionelosis, en el escupitajo, la sangre, y el orín para ayudar a identificar la causa de la neumonía. La enfermedad puede ser grave y es común que la gente resulte hospitalizada.

La *Fiebre de Pontiac* es una enfermedad más leve causada por la misma bacteria. A la gente que tiene Fiebre de Pontiac normalmente le da una fiebre que dura de 2 a 5 días, dolor de cabeza y dolores musculares, pero no les da neumonía. Los síntomas desaparecen sin tratamiento y la gente se recupera plenamente.

¿Cómo se transmite la bacteria *Legionella*?

Esta bacteria se encuentra naturalmente en el ambiente, típicamente en el agua. La bacteria prefiere crecer en ambientes de agua caliente como es común en bañeras (jacuzzis), torres de agua, y sistemas de aire acondicionado de edificios grandes. La gente se infecta cuando respiran el vapor o rocío que ha sido contaminado con la bacteria. Un ejemplo es cuando la gente respira el vapor caliente que emana de una bañera (jacuzzi) que no ha sido limpiada y mantenida adecuadamente.

¿Por cuánto tiempo puede alguien con legionelosis contagiar a otros?

Estas bacterias NO pueden ser pasadas de persona a persona.

¿Quién puede contraer la legionelosis?

Las personas mayores de 65 años y aquellos con un sistema inmunológico débil tienen mayor riesgo de enfermarse de legionelosis. La lista incluye a individuos con cáncer de pulmón crónico, cáncer, diabetes, problemas del riñón y personas que están en quimioterapia o otras drogas que debilitan el sistema inmunológico.

¿Cómo se trata la legionelosis?

Normalmente el tratamiento es con antibióticos intravenosos en el hospital. No se recomienda tratar la Fiebre de Pontiac con antibióticos por que la enfermedad es causada por inflamación del huésped (no por replicación de la bacteria).
Listeriosis

Summary

Listeriosis is caused by the bacterium *Listeria monocytogenes*. Infection results from ingestion of contaminated foods or from maternal transmission to the fetus or neonate. In high-risk individuals, listeriosis causes meningoencephalitis and/or septicemia. Signs and symptoms can include fever, headache, nausea, vomiting, and signs of meningitis. Pregnancy-associated infection can result in spontaneous abortion, fetal death or neonatal illness or death. Neonatal infection can manifest as pneumonia, septicemia, and meningitis. Laboratory diagnosis can be made by culture of blood, cerebrospinal fluid (CSF), amniotic fluid or other tissues; stool culture is not recommended. Antimicrobial therapy is indicated for patients with listeriosis. Persons at high risk of complications include newborns, pregnant women, persons who take steroid medication, organ transplant patients, the elderly and persons with impaired cell-mediated immunity. Pregnant women are about 20 times more likely than other healthy adults to get listeriosis, and the infection can be transmitted to the fetus. Persons at high risk of complications should avoid soft cheeses (such as brie, feta, Camembert, Mexican-style cheeses), unpasteurized milk or milk products, deli meats, refrigerated smoked fish, and cold salads from salad bars. They also should reheat (until steaming) leftover or ready-to-eat foods. In 2011, a large multistate outbreak was associated with eating cantaloupe from a specific farm in Colorado.

Agent

Listeriosis is caused by *Listeria monocytogenes*, a facultatively anaerobic, gram-positive bacillus.

Transmission

Reservoir:

The primary reservoir for *L. monocytogenes* is soil, forage, mud, and silage. Additional reservoirs include infected domestic and wild animals, fowl, and humans. Soft cheeses may support the growth of *L. monocytogenes* and have caused outbreaks. Listeria can multiply in refrigerated foods that are contaminated.

Mode of Transmission:

Foodborne transmission causes epidemics and sporadic infections. Implicated foods include contaminated unpasteurized milk, soft cheeses, prepared meats (such as hot dogs and deli meat), undercooked poultry, and unwashed raw fruits and vegetables. In pregnant women, asymptomatic fecal or vaginal carriage can result in neonatal infection.

Period of Communicability:

Infected individuals can shed the organism in their stool for several months though human-to-human transmission besides during and around pregnancy are rare. Mothers of infected newborn infants can shed the organism in vaginal discharge and urine for 7-10 days after delivery, rarely longer.

Clinical Disease

Incubation period:

Variable, but is longer in pregnancy-associated cases (2-4 weeks or occasionally up to 70 days.) Non-pregnancy related cases typically have an incubation period of 1 to 14 days.
Illness:

In non-immunocompromised hosts, the illness may be characterized by an acute, mild febrile illness. Infected pregnant women may experience only a mild, influenza-like illness. However, infections during pregnancy can lead to miscarriage or stillbirth, premature delivery, or infection of the newborn resulting in pneumonia, meningitis, or septicemia. The mother usually fully recovers. However, the case-fatality rate is 30% in newborns and approaches 50% when onset occurs in the newborn in the first four days of life. Spontaneous abortion can occur at any point in pregnancy. In other adults and children, disease usually manifests as meningoencephalitis and/or septicemia. Signs and symptoms can include fever, headache, nausea, vomiting, and signs of meningeal irritation. Delirium, coma, and shock can occur.

Laboratory Diagnosis

The organism can be cultured from a variety of body fluids, including blood, cerebrospinal fluid (CSF), meconium, gastric washings, placenta, and amniotic fluid. Stool specimens are not helpful in obtaining a diagnosis as the prevalence of stool carriage of *L. monocytogenes* is estimated to be between 1-5%. PCR can be used to identify similar strains in an outbreak setting.

Treatment

Antimicrobial therapy is indicated for patients with listeriosis. Initial therapy with IV ampicillin and an aminoglycoside (usually gentamicin) is recommended for severe infections including meningitis, encephalitis, endocarditis and infections in neonates and immunocompromised patients. In immunocompetent patients with mild infections, ampicillin alone can be used. Treatment decisions should be made in conjunction with the patient’s health care provider. Infectious disease physician consultations should be considered, especially for patients with severe infections.

Surveillance

Case Definition:

*Confirmed*

A clinically compatible case associated with isolation of *L. monocytogenes* by culture from a normally sterile site or if miscarriage or stillbirth has occurred, isolation of *L. monocytogenes* from placental or fetal tissue.

Reporting:

Report all suspected or confirmed cases of listeriosis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Complete the CDC Listeria Case Form and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

Control Measures

1. Case management
   1.1. Isolation: None required.
1.2. Prophylaxis (for fetuses of pregnant women): Antimicrobial therapy for infection diagnosed during pregnancy may prevent fetal or prenatal infection and its consequences.

2. Contact management
   2.1. Isolation: None required.

3. Prophylaxis: Not applicable

4. Prevention
   4.1. Persons at high risk of complications from listeriosis should avoid soft cheeses (such as brie, feta, Camembert, Mexican-style cheeses including queso blanco, queso fresco, and queso panela), unpasteurized milk or milk products, deli meats, refrigerated smoked fish (including salmon, trout, whitefish, cod, tuna or mackerel, especially those labeled nova-style, lox, kippered, smoked or jerky), and cold salads from salad bars.

   4.2. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

   General guidelines for preventing foodborne illness include:
   - Thoroughly cook raw food from animal sources;
   - Wash raw fruits and vegetables before eating;
   - Keep uncooked meats separate from vegetables, fruits, cooked foods and ready-to-eat foods;
   - Avoid unpasteurized dairy products;
   - Wash hands, knives, and cutting boards after handling uncooked foods;
   - Use precooked and ready-to-eat foods as soon as possible;
   - Keep refrigerator set at 40 degrees Fahrenheit or colder.

4.3. Immunization: Not applicable.

Management of Listeriosis in Child Care Centers
Contact the Epidemiology and Response Division at 505-827-0006 for recommendations

References


What is listeriosis?
Listeriosis is a disease caused by eating food “dirtied” or contaminated with the *Listeria monocytogenes* bacteria.

What are the symptoms of listeriosis?
Symptoms usually occur about 1 to 14 days after exposure but may be longer in cases of infected pregnant women, up to 70 days after exposure. The disease may be mild or severe.
- Mild symptoms include fever and muscle aches and sometimes nausea or diarrhea. Healthy children and adults may not have any symptoms.
- Severe symptoms include sudden fever, intense headache, and stiff neck and confusion, loss of balance and convulsions. These may occur when the infection spreads to the nervous system or bloodstream. This is more likely to happen in newborns and adults with weak immune systems (e.g., persons with cancer, diabetes, or an organ transplant).
- If a woman is infected while pregnant, she may not feel very ill, but may have a premature delivery or even lose the baby as a result of infection. A baby can also become infected during the last trimester of pregnancy or during birth, and then become sick in the first three weeks of life.

How is listeriosis spread?
Eating or consuming raw or contaminated milk, soft cheeses, unwashed raw vegetables, undercooked poultry and ready-to-eat meats (like cold cuts) can cause infection. Listeriosis may also be spread from a pregnant woman to her baby in the womb or during birth.

How long are people contagious?
Infected humans can shed the bacteria in stool for several months. Mothers of infected newborn infants may shed the bacteria in vaginal discharges and urine for 7 to 10 days after delivery. This disease is not very contagious since the bacteria are not easily passed from one person to another.

Who gets listeriosis?
Anyone can get listeriosis, but there are certain groups of people more likely to get sick.
- Unborn babies and newborns.
- Pregnant women.
- Persons who have weak immune systems.
- Elderly persons.

What treatment is available for people with listeriosis?
Ampicillin and gentamicin are used to treat listeriosis. Antibiotics may be given to infected pregnant women to prevent illness in the baby.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria are passed in stool, people with diarrhea should be excluded from day care, patient care, and food handling. Most infected people may return to work or school when their diarrhea stops, provided that they carefully wash their hands after using the toilet and before preparing and/or eating food.

How can I protect myself and my family from getting listeriosis?
- Pregnant women and persons with weak immune systems persons should *not* eat soft cheeses such as feta, Brie or “queso fresco”.
- Avoid raw milk and other unpasteurized dairy products.
- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Immediately wash cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached particularly when cooking using a microwave.
¿Qué es la listeriosis?
Es una enfermedad causada por comer alimentos contaminados con la bacteria *Listeria monocytogenes*.

¿Cuáles son los síntomas de la listeriosis?
Los síntomas normalmente aparecen como 3 semanas después de haber estado expuesto, pero pueden aparecer en tan sólo un día o más que 3 semanas después el expuesto. La enfermedad puede ser leve o grave.

- Los síntomas leves incluyen fiebre y dolores musculares y, a veces, diarrea o náuseas. Los niños y adultos que están sanos pueden no tener ningún síntoma.
- Los síntomas graves incluyen aparición repentina de fiebre, dolor de cabeza intenso, rigidez en el cuello y confusión, pérdida del equilibrio y convulsiones. Estos pueden ocurrir cuando la infección ha pasado al sistema nervioso o a la sangre. Es más posible que ocurra en recién nacidos y adultos cuyo sistema inmunológico está debilitado (por ejemplo, porque tienen cáncer, diabetes o han recibido un trasplante).
- Si una mujer embarazada contrae la infección, puede que no se sienta muy enferma, pero es posible que tenga el bebé antes de tiempo o incluso pierda al bebé a consecuencia de la infección. Un bebé también puede contraer la infección durante el último trimestre del embarazo o en el momento del parto, y entonces enfermarse durante sus tres primeras semanas de vida.

¿Cómo se transmite la listeriosis?
Se puede contraer la infección, si se consume leche cruda (sin pasteurizar) o contaminada, quesos blandos, verduras crudas sin lavar, carne de ave que no está bien cocinada y embutidos. La listeriosis también se puede transmitir de madre a hijo durante el embarazo o en el parto.

¿Por cuánto tiempo pueden las personas con listeriosis contagiar a otros?
Las personas infectadas pueden expulsar la bacteria en sus heces por meses. Las madres de recién nacidos que se han infectado pueden tener la bacteria en las secreciones vaginales y orina por casi dos años (7-10 días) tras el parto. Esta enfermedad no es muy contagiosa, ya que la bacteria no se pasa fácilmente de persona a persona.

¿Quién puede contraer la listeriosis?
Cualquiera puede contraer listeriosis, los grupos de mayor riesgo son:

- Bebés que todavía no han nacido y recién nacidos.
- Mujeres embarazadas.
- Personas cuyo sistema inmunológico está debilitado.
- Personas mayores.

¿Cómo se trata la listeriosis?
Se usa la ampicilina junto con otros antibióticos. Se puede dar antibióticos a las mujeres embarazadas que tengan la infección para prevenir que se la pase al bebé.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Como la bacteria se encuentra en las heces, las personas que tengan diarrea no deben ir a la guardería, tampoco deben trabajar las personas que tratan a pacientes o que manipulan alimentos. La mayoría de los infectados pueden regresar al trabajo o la escuela cuando dejen de tener diarrea, pero tienen que llevar especial cuidado y lavarse bien las manos después de usar el baño o antes de preparar comida.

¿Cómo puedo protegerme yo y proteger a mi familia contra la listeriosis?

- Las mujeres embarazadas y los que tienen su sistema inmunológico debilitado no deben comer quesos blandos como feta o brie.
- Evite la leche cruda y otros productos lácteos sin pasteurizar.
- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Lave los tableros para cortar de inmediato y también los mostradores que se hayan usado para preparar comida, de esta forma evita que otras cosas se puedan contaminar.
- Cuando cocine, asegúrese de que los alimentos alcancen la temperatura de cocción interna correcta, sobre todo si usa un microondas.
Measles (Rubeola)

Summary
Measles is an acute viral disease characterized by fever (as high as 105°F), cough, coryza, conjunctivitis and followed by a maculopapular rash. The rash begins in the face and spreads to other parts for the body. The diagnosis should be confirmed by laboratory testing using serology, reverse transcriptase polymerase chain reaction assay (RT-PCR) or culture.

Agent
Measles virus is a single stranded RNA virus that belongs to the family paramyxoviridae

Transmission
Reservoir:
Humans are natural hosts and no know animal reservoirs

Mode of transmission:
Airborne by droplet spread and direct contact with nasal or throat secretions of infected people. Measles is one of the most highly communicable infectious diseases.

Period of communicability:
From 4 days before the onset of rash to four days after rash onset.

Clinical Disease
Incubation period:
Range of 8-12 days (mean: 10 days) from exposure to onset of symptoms. The average interval between the appearance of rash in the index case and subsequent cases is 14 days with a range of 7-21 days.

Illness:
Measles is an acute disease with prodromal fever, conjunctivitis, coryza, and cough. A characteristic rash usually appears about the fourteenth day after exposure. The rash typically begins behind the ears and on the forehead, and then spreads centrifugally from the head to the feet; however, atypical rash presentations occur as well. The rash is initially erythematous and maculopapular but becomes confluent as the rash spreads. Koplik spots, which are small spots with white or bluish-white centers on the buccal mucosa, can be present. Leukopenia is common. The disease is more severe among infants and adults. Complications include otitis media, pneumonia, croup, and encephalitis.

Laboratory Diagnosis
Diagnostic testing for measles should include serologic, molecular and virologic testing.

The detection of measles-specific IgM antibodies, viral presence in a nasopharyngeal swab by RT-PCR, or a significant rise in measles-specific IgG antibody concentration between acute and convalescent sera establishes the diagnosis.

Virus can be isolated in cell culture from blood or nasopharyngeal swab collected before the fourth day of rash, or urine specimens obtained before the eighth day of rash.

Because measles is rare in the US, the diagnosis should be confirmed by laboratory testing.
**Treatment**

No specific antiretroviral therapy is available for measles. However, Ribavirin has been used to treat severely ill and immunosuppressed children by intravenous and aerosol routes.

Vitamin A administration is recommended for children diagnosed with measles where vitamin A deficiency is a recognized problem.

**Surveillance**

**Case Definition:**

**Clinical case definition**

A generalized rash lasting greater than or equal to three days, and a temperature greater than or equal to 101.0°F (greater than or equal to 38.3°C), and cough, coryza, or conjunctivitis.

**Laboratory criteria**

- Positive serologic test for measles-specific IgM antibody; or
- Significant rise in measles-specific IgG antibody level by any evaluated and validated serologic assay; or
- Isolation of measles virus from a clinical specimen; or
- Positive RT-PCR from a clinical specimen.

**Confirmed** – An illness that meets clinical criteria with:

- Confirmed laboratory criteria; or
- Direct epidemiologic linkage to a case confirmed by one of the laboratory methods above

**Probable** – An illness that meets clinical criteria with:

- No epidemiologic linkage to a laboratory-confirmed measles case; and
- Noncontributory or no measles laboratory testing

**Suspect** – Any febrile illness accompanied by rash

**Epidemiologic Classification of Internationally-Imported and US-Acquired Cases**

**Internationally-Imported Case:**

An internationally imported case is defined as a case in which measles results from exposure to measles virus outside the United States (US) as evidenced by at least some of the exposure period (7–21 days before rash onset) occurring outside the US and rash onset occurring within 21 days of entering the US and there is no known exposure to measles in the US during that time. All other cases are considered US-acquired.

**US-Acquired Case:**

A US-acquired case is defined as a case in which the patient had not been outside the US during the 21 days before rash onset or was known to have been exposed to measles within the US.

**Reporting:**

Report all suspected or confirmed cases of measles immediately (24/7/365) to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.
Case Investigation:

Complete the CDC Measles Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

Control Measures

1. Case management
   1.1. Isolation: Persons with measles should be excluded from work, school, or child care for four days after rash develops.
      1.1.a In hospitals and institutions, patients should be placed in airborne precautions from onset of catarrhal stage of the prodromal period through the fourth day of rash.
   1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. Evidence of measles immunity: Persons can be considered immune to measles if they: 1) were born before 1957; 2) have documentation of physician-diagnosed measles; 3) have laboratory evidence of immunity to measles; or 4) have documentation of adequate measles vaccination. One dose of MMR vaccine, or other presumptive immunity, is sufficient for most adults born on or after 1957. Adequate vaccination for preschool-aged children (12 months of age and older) is one dose of measles/mumps/rubella (MMR) (see section 3.1 below). For school-aged children, adolescents and adults, two doses of MMR are recommended.
      2.1.a Some adults may have received a killed measles vaccine during 1963 to 1968. People vaccinated during those years are not considered to have adequate immunization and the recommendation is for them to be re-vaccinated.
      2.1.b Certain adults are considered to be high risk and need two doses of MMR, administered at least 28 days apart, unless they are considered immune based on the criteria listed above. These adults include: 1) students at post-high school education institutions; 2) healthcare personnel; 3) international travelers.
      2.1.c During an outbreak, a second dose of MMR should be considered for children aged 1 through 4 years or adults who have only received 1 dose. If the outbreak involves infants aged <12 months with ongoing risk of exposure, infants aged ≥6 months can be vaccinated.
   2.2. Isolation: Exposed susceptible persons (those who cannot demonstrate adequate immunity as listed above), including those who have been exempted from measles vaccination, if not immunized within 72 hours of exposure, should be excluded from work, school, child care, or any other group activities until at least 21 days after the onset of rash in the last case of measles.
   2.3. Prophylaxis:
      2.3.a Live virus measles vaccine, if given within 72 hours of measles exposure, may prevent disease in susceptible persons. If the exposure dose does not result in infection, the vaccine should induce protection against subsequent measles exposures. Vaccine is the intervention of choice for control of measles outbreaks in schools and child care centers.
      2.3.b Immune globulin (IG) for post-exposure prophylaxis can be used within six days of exposure for susceptible household or other contacts, particularly in whom the risk of complications is very high (such as pregnant women, immunocompromised persons, and those under one year of age). The usual dose is 0.25 mL/kg of body weight given
intramuscularly. Immunocompromised persons should receive 0.5 mL/kg (max dose in either instance is 15 mL). IG is not indicated for household contacts who have received one dose of vaccine at 12 months of age or older unless they are immunocompromised.

3. Prevention

3.1. Immunization:

3.1.a A single dose of live, attenuated measles virus vaccine elicits a significant antibody response in 95% of susceptible persons at 12 months of age and 98% at 15 months of age. Measles vaccine is to be administered as a component of the MMR or measles/mumps/rubella/varicella (MMRV) vaccine when a child is 12-15 months of age and at school entry at 4-6 years.

3.1.b Special emphasis must continue to be placed on the immunization of susceptible adolescents and young adults in high school, college, and health care settings.

Management of Measles in Child Care Centers

- Contact the Epidemiology and Response Division (ERD) immediately for any suspected or confirmed case of measles in a school or child care center.
- Children with measles should be kept out of school or child care for four days after rash develops.
- Immunization records of all child care attendees and staff should be reviewed. Refer to section 2.1 above for definition of immunity to measles. Exposed susceptible persons, including those who have been exempted from measles vaccination, if not immunized within 72 hours of exposure, should be excluded from the child care facility until at least 21 days after the onset of rash in the last case of measles.

References


What is measles (rubeola)?
Measles is a highly contagious disease caused by a virus. Sometimes it is called the ‘10- day,’ ‘hard’ or ‘red’ measles. This is different than rubella which is sometimes called ‘German’ or ‘3-day’ measles. People sometimes confuse these diseases.

What are the symptoms of measles?
Symptoms usually begin within 8 to 12 days after exposure, with an average of 10 days. The rash usually appears within 14 days of exposure. Measles symptoms usually occur in two stages. In the first stage, most people have a fever, runny nose, redness of the eye(s) and cough. The second stage begins around the third to seventh day when a red blotchy rash begins to develop on the face and spreads over the entire body. Little white spots, called Koplik’s spots, may also be seen on the gums and inside of the cheeks.

How is measles spread?
Measles viruses spread very easily through the air when someone with measles coughs or sneezes or by direct contact with infected nose or throat secretions.

How long are people contagious?
People are contagious from 4 days before symptoms begin until 4 days after the rash appears.

Who gets measles?
Although a person of any age can get measles, it is usually regarded as a childhood disease. Generally, preschool children, adolescents, young adults and inadequately immunized individuals have most of the measles cases in the United States. You can only get measles once in a lifetime; a person has permanent immunity after having the disease.

What treatment is available for people with measles?
There is no specific treatment for measles.

Do infected people need to be kept home from school, work or daycare?
People should stay home from work, school, daycare, or other settings where others could be exposed until at least four days after the rash develops.

How can I protect myself and my family from getting measles?

- Anyone born on or after January 1, 1957, who does not have a history of physician-diagnosed measles or serologic confirmation of measles immunity, should receive at least one dose of MMR vaccine (preferably two doses, at least 28 days apart), for maximum protection.
- Wash hands frequently with water and soap. Teach children to wash their hands too. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Always cover your nose and mouth when you cough or sneeze and then wash your hands.
¿Qué es el sarampión?
El sarampión es una enfermedad muy contagiosa causada por un virus. Es diferente de la rubéola, ésta produce un sarpullido muy similar y en inglés se conoce como sarampión alemán o sarampión de tres días, por eso, se confunden.

¿Cuáles son los síntomas del sarampión?
Los síntomas normalmente comienzan entre 8 y 12 días después de haber estado expuesto, 10 días es lo regular. El sarpullido suele aparecer en un plazo de 14 días. Los síntomas ocurren en dos fases. En la primera fase, los síntomas iniciales suelen ser fiebre, nariz mocoas, ojos rojos y tos. La segunda fase comienza entre el tercer día y el séptimo, cuando empieza el sarpullido en la cara y se extiende por todo el cuerpo. Aparecen pequeñas manchas blancas, se llaman manchas de Koplik, que se pueden ver en las encías y el interior de las mejillas.

¿Cómo se transmite el sarampión?
El virus del sarampión se transmite fácilmente a través del aire cuando una persona enferma con sarampión estornuda o tose o por contacto directo con las secreciones nasales o de la garganta.

¿Por cuánto tiempo alguien con sarampión puede contagiar a otros?
Se puede contagiar desde 4 días antes de desarrollar síntomas hasta 4 días después de que haya aparecido el sarpullido.

¿Quién puede contraer el sarampión?
Aunque las personas de cualquier edad pueden contraer el sarampión, se conoce más por ser una enfermedad en niños. Normalmente, en Estados Unidos los casos se dan en niños de edad preescolar, adolescentes, jóvenes y en aquellos que no han recibido las vacunas debidas. Después de haber pasado la enfermedad, se desarrolla inmunidad para toda la vida y no se volverá a pasar.

¿Cómo se trata el sarampión?
No hay un tratamiento específico para el sarampión.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas infectadas deben quedarse en casa y no ir a la escuela, a la guardería, al trabajo o a otros lugares donde puedan exponer a otros al virus por al menos cuatro días después de que haya aparecido el sarpullido.

¿Cómo puedo protegerme yo y proteger a mi familia contra el sarampión?
- Cualquier persona nacida antes del 1 de enero de 1957, que no tenga una historia clínica comprobada de haber pasado la enfermedad o confirmación de inmunidad con un análisis de sangre, debe recibir al menos una dosis de la vacuna triple viral (MMR en inglés, contra el sarampión, papera y rubéola), pero preferiblemente dos dosis (al menos 28 días aparte) para tener la máxima protección.
- Siempre lávase bien y con frecuencia las manos con agua y jabón, y enséñele a los niños a hacerlo también. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Siempre cúbrase la nariz y la boca al toser o estornudar y después lávese las manos.
Meningococcal Disease

Summary
Suspected invasive meningococcal disease is a medical and public health emergency. Quick medical attention is extremely important if meningococcal disease is suspected. Transmission is through direct exposure to the index patient’s oral secretions only, not through casual contact. Chemoprophylaxis should only be provided for close contacts of a meningococcal disease case (household members, contacts at daycare centers, and anyone else directly exposed to an infected patient’s oral secretions such as through kissing or mouth-to-mouth resuscitation). Keeping vaccinations up to date is the best way to prevent meningococcal disease.

Those at greatest risk for infection and invasive disease include:

- Children under 2 years of age and adolescents/young adults 16-23 years of age.
- Household or close contacts of case patients.
- Persons with persistent complement component deficiencies (e.g., C5—C9, properdin, factor H, or factor D) or functional or anatomic asplenia.
- Those in crowded living conditions, such as college students residing in dormitories or those living in military barracks.
- Day care attendees and workers.
- Microbiologists who work with isolates of N. meningitidis.
- Persons traveling to a country where meningococcal disease is epidemic or highly endemic, particularly sub-Saharan Africa.

Keeping vaccination up to date is the best defense against meningococcal disease.

Agent
*N. meningitidis* is a gram-negative diplococcus with 13 serogroups. Serogroups B, C, and Y each account for approximately one-third of reported cases in the US. Serogroups C, Y and W-135 cause 75% of meningococcal disease among adolescents and young adults, and are prevented by vaccination. Serogroup B currently causes approximately 60% of cases in children 0-59 months. Serogroups A, W, and X exist mainly in developing countries, particularly Africa.

Transmission
Reservoir:
Humans. As many as 10% of adolescents and adults are asymptomatic transient carriers of *N. meningitidis*, most strains of which are not pathogenic.

Mode of transmission:
*N. meningitidis* colonizes the upper respiratory tract (nasopharynx) and is spread person-to-person through droplets. Transmission requires close contact, such as coughing, kissing, sharing utensils, intubation or performing aerosol generating procedures without using personal protective equipment.
Period of communicability:

From the time the person is first infected until meningococci are no longer present in discharges from the mouth and nose. Meningococci usually disappear from the nasopharynx within 24 hours after starting effective antibiotic treatment.

**Clinical Disease**

**Incubation period:**

From 1-10 days, usually less than four days.

**Illness:**

Invasive illness frequently results in meningococcemia (sepsis), meningitis, or both. Onset can be insidious and nonspecific but often is abrupt, characterized by fever, chills, malaise, myalgia, prostration, and a rash that initially may be urticarial, maculopapular, or petechial. In fulminant cases, purpura (red or purple discolorations on the skin that do not blanch on applying pressure), limb ischemia, coagulopathy, pulmonary edema, shock, coma, and death can ensue within several hours despite appropriate therapy.

Symptoms of meningococcal meningitis are similar to those associated with acute meningitis caused by other pathogens, including fever, headache, stiff neck, nausea, vomiting, photophobia, and altered mental status. Raised intracranial pressure is a predominant presenting feature among severe and fatal cases of meningococcal meningitis.

Invasive infections can be complicated by septic arthritis, myocarditis, pericarditis, and pneumonia.

Sequelae may include hearing loss, skin scarring, limb or digit amputations, and/or neurologic disability. These occur in approximately 11 to 19% of survivors.

**Laboratory Diagnosis**

Cultures of blood and cerebrospinal fluid (CSF) are indicated for patients with suspected invasive meningococcal disease. Cultures of petechial or purpuric lesion scrapings, synovial fluid, and other sterile site specimens may be useful in some patients. Throat or nasopharyngeal cultures are of no value because *N. meningitidis* can be part of normal flora at these sites.

A gram stain of petechial or purpuric lesions, blood or CSF may also be helpful. Bacterial antigen testing from CSF, such as latex agglutination, may support the diagnosis of a probable case with consistent clinical illness. However, this method is not preferred as it commonly results in false-negative results, particularly among serogroup B disease. Antigen tests of urine or serum are unreliable.

PCR can be used, and may be especially helpful among patients whose clinical specimens were collected after initiation of antibiotic therapy.

**Treatment**

It is important that treatment begin as soon as possible. Treatment priorities are treating shock in cases with meningococcemia and raised intracranial pressure in cases of meningitis. In meningococcemia presenting with shock, early use of inotropic and ventilator support, combined with rapid fluid resuscitation, may reduce mortality.
Empiric therapy for suspected meningococcal disease should include an extended-spectrum cephalosporin such as cefotaxime or ceftriaxone. After the diagnosis has been lab-confirmed, treatment with penicillin G (300 000U/kg/day; maximum 12 million u/day, divided every 4-6 hours), ampicillin, or continued extended spectrum cephalosporin treatment is recommended.

Chloramphenicol is recommended in the case of a known severe penicillin allergy. Meropenem can be used if chloramphenicol is not available (although penicillin-allergic adults can have cross-reactivity with meropenem).

Some experts recommend susceptibility testing before switching to penicillin. However, resistance of *N. meningitidis* to penicillin is rare in the United States, susceptibility testing is not standardized, and the clinical significance or intermediate susceptibility is unknown. For travelers in areas where penicillin resistance has been reported, cefotaxime, ceftriaxone, or chloramphenicol is recommended.

Five to seven days of therapy is adequate for most cases of invasive disease.

One dose of ceftriaxone eliminates carriage and can be useful for outpatient treatment.

**Surveillance**

**Case Definitions:**

**Confirmed**

- Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood, CSF, synovial, pleural, or pericardial fluid), using a PCR test
- Isolation of *N. meningitidis*
- From a normally sterile body site (e.g., blood, CSF, synovial, pleural, or pericardial fluid); or
- From purpuric lesions

**Probable**

- Detection of *N. meningitidis* antigen
- In formolin-fixed tissue by immunohistochemistry (IHC); or
- In CSF by latex agglutination

**Suspected**

- Clinical purpura fulminans in the absence of a positive blood culture; or
- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site (e.g., blood or CSF)

The following definitions can be used to describe a case of meningococcal disease:

**Primary case:** A primary case of meningococcal disease is one that occurs in the absence of previous known close contact with another patient with meningococcal disease.

**Secondary case:** A secondary case of meningococcal disease is one that occurs among close contacts of a primary case 24 hours or more after onset of illness in the primary patient.
Co-primary case: Co-primary cases are two or more cases that occur among a group of close contacts with onset of illness separated by less than 24 hours.

Close contacts: Close contacts of a patient who has meningococcal disease include:

- Household members (including dormitory room, barracks.)
- Child care center contacts.
- Persons directly exposed to the patient’s oral secretions (e.g., by kissing, sharing utensils, mouth-to-mouth resuscitation, endotracheal intubation, or endotracheal tube management.)

Reporting:

Report all suspected or confirmed cases of meningococcal disease immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, phone number, occupation, and health care provider.

Case Investigation:

Use the Bacterial Meningitis Invasive Respiratory Investigation (BMIRD) Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

**Control Measures**

1. Case management

   1.1. Isolation: Droplet precautions, in addition to standard precautions, are indicated for 24 hours after the start of effective antimicrobial therapy.

   1.2. Systemic antimicrobial therapy for meningococcal disease with agents other than ceftriaxone or other third-generation cephalosporins might not reliably eradicate nasopharyngeal carriage of N. meningitidis. If other agents have been used for treatment, the index patient should receive chemoprophylactic antibiotics for eradication of nasopharyngeal carriage before being discharged from the hospital.

2. Contact Management

   2.1. Exposed household, school, or child care contacts must be observed carefully. If a febrile illness develops, prompt medical evaluation should occur.

   2.2. Regardless of immunization status, chemoprophylaxis administered as soon as possible (preferably within 24 hours of identification of suspected or confirmed index case) is recommended for:

      2.2.a. Household contacts, especially children younger than two years.

      2.2.b. People who frequently slept or ate in the same dwelling as the index case during the seven days before onset of illness in the index case.

      2.2.c. Child care, preschool, or nursery school contacts during the seven days before onset of illness in the index case.
2.2.d. Persons with direct exposure to index patient’s secretions (e.g., sharing toothbrushes, kissing, sharing cigarettes or eating utensils) during the seven days before onset of illness in the index case.

2.2.e. Medical personnel who have had intimate exposure, such as mouth-to-mouth resuscitation, or unprotected endotracheal intubation, or suctioning before or less than 24 hours after antimicrobial therapy was initiated.

2.2.f. Passengers seated directly next to the index case during airline flights lasting more than eight hours.

2.3. Chemoprophylaxis may be recommended for laboratory employees:

2.3.a. Who are exposed percutaneously to a *N. meningitidis* isolate.

2.3.b. Who have a mucosal exposure to a *N. meningitidis* isolate.

2.3.c. Who may have been exposed to the organism during specimen handling and identification.

2.4. Rifampin, ciprofloxacin, azithromycin, and ceftriaxone are appropriate for chemoprophylaxis in adults, but rifampin and ciprofloxacin are not recommended for pregnant women. Rifampin or ciprofloxacin are recommended for most children. Rifampin requires 4 doses over 2 days to eradicate nasopharyngeal carriage, but ceftriaxone, ciprofloxacin, and azithromycin only require a single dose.

2.5. Chemoprophylaxis is not recommended for:

2.5.a. Casual contact where there is no history of direct exposure to the index patient’s oral secretions (e.g., school or work).

2.5.b. Indirect contacts (whose only contact is with a high-risk contact and not directly with the index case).

2.5.c. Health care personnel without direct exposure to patient’s oral secretions

2.5.d. Call the medical epidemiologist on-call at (505) 827-0006 to review the nature and extent of contact for each case if questions exist.

2.5.e. In an outbreak or cluster chemoprophylaxis for people other than people at high risk should be administered only after consultation with a medical epidemiologist.

2.6. Vaccination: Because secondary cases can occur several weeks or more after onset of disease in the index case, meningococcal vaccine is an adjunct to chemoprophylaxis when an outbreak is caused by a serogroup prevented by a meningococcal vaccine. For control of meningococcal outbreaks caused by vaccine preventable serogroups (A, C, Y and W-135), the preferred vaccine in adults and children two years and older is a meningococcal conjugate vaccine. For outbreaks caused by Serogroup B, the serogroup B vaccination is recommended.

3. Prevention

3.1. The main method of preventing meningococcal disease is immunization. The licensed vaccines for *N. meningitidis* available in the US are:
3.1.a. Meningococcal polysaccharide vaccine (MPSV4 or Menomune®, 1974;
3.1.b. Meningococcal conjugate vaccines (MCV4: Menactra, 2005 and
Menveo, 2010, and
3.1.c. Serogroup B meningococcal vaccine (Bexsero and Trumenba)).
Meningococcal conjugate vaccine (Menactra®, Menveo®, or MenHibrix®) is
recommended for children who are between 2 months and 10 years old, if they:
• Have a complement component deficiency disorder.
• Are taking the medicine called Soliris®.
• Have a damaged spleen or their spleen has been removed.
• Have HIV.
• Are traveling to or residing in countries in which the disease is common.
• Are part of a population identified to be at increased risk because of a
serogroup A, C, W, or Y meningococcal disease outbreak.
Children 10 years or older should get a serogroup B meningococcal vaccine
(Bexsero® or Trumenba®) if they:
• Have a complement component deficiency disorder.
• Are taking a medicine called Soliris®.
• Have a damaged spleen or their spleen has been removed.
• Are part of a population identified to be at increased risk because of a
serogroup B meningococcal disease outbreak.
3.2 Preteens and Teens
There are two types of meningococcal vaccines for preteens and teens:
• Meningococcal conjugate vaccines (Menactra® or Menveo®.)
• Serogroup B meningococcal vaccines (Bexsero® or Trumenba®.)
All 11 to 12-year olds should be vaccinated with a meningococcal conjugate vaccine
(Menactra® or Menveo®), with a booster dose given at 16 years old.
Teens may also be vaccinated with a serogroup B meningococcal vaccine (2 or 3
doses depending on brand), preferably at 16 through 18 years old.
Preteens and teens should get a serogroup B meningococcal vaccine (Bexsero® or
Trumenba®) if they:
• Have a complement component deficiency disorder.
• Are taking Soliris®.
• Are asplenic, functionally or anatomically.
• Are part of a population identified to be at increased risk because of a
serogroup B meningococcal disease outbreak.
3.3. Adults
Meningococcal vaccines are recommended for certain groups of adults at increased risk for meningococcal disease. Each meningococcal vaccine is listed below with which groups of adults are recommended to get it.

**Meningococcal Conjugate Vaccine Recommendations**

Adults should get a meningococcal conjugate vaccine (Menactra® or Menveo®) if they:
- Have a complement component deficiency disorder.
- Are taking Soliris®.
- Are asplenic, functionally or anatomically.
- Are HIV positive.
- Are a microbiologist who is routinely exposed to *Neisseria meningitidis*.
- Are traveling to or residing in countries in which the disease is common.
- Are part of a population identified to be at increased risk because of a serogroup A, C, W, or Y meningococcal disease outbreak.
- Are not up to date with this vaccine and are a first-year college student living in a residence hall.
- Are a military recruit.

**Meningococcal Polysaccharide Vaccine Recommendations**

Adults 56 years or older should get the meningococcal polysaccharide vaccine (Menomune®) if they are anticipated to only need one dose and they:
- Are traveling to or residing in countries in which the disease is common.
- Are part of a population identified to be at increased risk because of a serogroup A, C, W, or Y meningococcal disease outbreak.
- Have not previously been vaccinated with a meningococcal conjugate vaccine (Menactra® or Menveo®.)

**Serogroup B Meningococcal Vaccine Recommendations**

Adults of any age should get a serogroup B meningococcal vaccine (Bexsero® or Trumenba®) if they:
- Have a complement component deficiency disorder.
- Are taking Soliris®.
- Are asplenic, functionally or anatomically.
- Are a microbiologist who is routinely exposed to *Neisseria meningitidis*.
- Are part of a population identified to be at increased risk because of a serogroup B meningococcal disease outbreak.

4. **Outbreak Management**

   4.1. **Outbreak Definition:**

A community-based outbreak is defined as the occurrence of three or more confirmed or probable primary cases of meningococcal disease in a period of
three months or less among persons residing in the same area who are not close contacts and who do not share a common affiliation, with a primary attack rate of 10 or more cases per 100,000 population.

An organization-based outbreak is defined as the occurrence of three or more confirmed or probable cases of meningococcal disease of the same serogroup in period of three months or less among persons who have a common affiliation but no close contact with each other, resulting in a primary disease attack rate of 10 or more cases per 100,000 persons. In some instances, the attack rate will be greater than 10 cases per 100,000 population with only two or three cases. In these situations, vaccination may be considered after only two primary cases are identified. Examples of an organization-based outbreak include cases in schools, churches, and universities.

4.2. Vaccination

When deciding to implement a mass vaccination campaign to prevent meningococcal disease, one must consider whether the cases represent an outbreak or an unusual clustering of endemic cases. Mass vaccination programs are expensive, require considerable public health effort, and may create excessive concern among the public. Because the number of cases in outbreaks is usually not substantial, this determination requires evaluation and analysis of the patterns of disease occurrence.

Vaccination of the population at risk should be considered if the attack rate is greater than 10 cases per 100,000 population, but the actual attack rate at which the decision to vaccinate is made will vary. The following factors should be considered when making the decision to vaccinate:

- Completeness of case reporting and number of possible cases of meningococcal disease for which bacteriologic confirmation or serogroup data are not available.
- Occurrence of additional cases of meningococcal disease after recognition of a suspected outbreak (e.g., if the outbreak occurred two months previously and no additional case have occurred, vaccination might be unlikely to prevent additional cases of meningococcal disease.)
- Logistical and financial considerations.

During an outbreak caused by serogroup A, C, W, or Y meningococcal disease, vaccination with a quadrivalent meningococcal conjugate vaccine is routinely recommended for those 2 months or older identified as being at increased risk because of the outbreak.

Newly licensed serogroup B meningococcal vaccines are an important step forward for controlling serogroup B meningococcal disease, especially in outbreak settings. For outbreaks caused by serogroup B meningococcal disease, vaccination with a serogroup B meningococcal vaccine is recommended for those 10 years or older identified as being at increased risk because of the outbreak.

There are two vaccines that provide protection against serogroup B meningococcal disease: Bexsero® (GlaxoSmithKline) and Trumenba® (Pfizer). In the setting of an outbreak, two doses are needed for Bexsero® and three doses are needed for Trumenba®. Both vaccines are expected to help protect against most serogroup B
meningococcal strains circulating in the United States. The same vaccine brand must be used for all doses — Bexsero® and Trumenba® are not interchangeable. If someone received one brand and decides to switch to the other, it is recommended they wait at least 1 month between products and then get the full series of the second vaccine.

It does not matter which brand someone receives. Neither of these vaccines will prevent all cases and each vaccine may perform better against some strains than others. In some outbreak situations, there may be a stated preference for one brand over the other if lab testing suggests that one vaccine may provide better protection against the specific strain causing the outbreak. However, there is a limited understanding of how well laboratory test results correspond to the actual effectiveness of each vaccine against any particular strain. Until these vaccines are used more broadly in response to outbreaks, actual effectiveness against specific strains remains unknown.

4.3 Other Control Measures

Mass chemoprophylaxis is not recommended for control of large outbreaks of disease for multiple reasons: cost of drug and administration, difficulty of ensuring simultaneous administration of drugs to substantial populations, drug side effects, and emergence of resistant organisms. In most outbreak settings, these disadvantages outweigh the potential benefit. Situations in which mass chemoprophylaxis could be successful include those involving limited or closed populations, such as a single school or residential facility. If the decision is made to use mass chemoprophylaxis, it should be administered to all persons at the same time.

4.4 Antibiotic Usage

It is possible that even in a vaccine-preventable, organization-based outbreak, antibiotic distribution may be a timelier intervention, since preventive antibodies take 7–10 days to develop after vaccination. Again, the potential benefit of mass chemoprophylaxis must be weighed against the possible emergence of antibiotic resistance and the logistics of launching a prophylaxis campaign.

4.5 Closures and Restrictions

Restricting travel to areas with an outbreak, closing schools or universities, or cancelling sporting or social events are not recommended measures for outbreak control in the US. A crucial part of managing suspected meningococcal disease outbreaks and promoting early case recognition is educating communities, physicians, and other healthcare personnel about meningococcal disease.

Management of Meningococcal Disease in Child Care Centers

When a case of invasive meningococcal disease is detected in a child care attendee or staff person, the center should work with ERD to provide accurate information about meningococcal disease and the risk of transmission to families and contacts of the index case. Questions regarding the use of chemoprophylaxis or mass immunization should be referred to the ERD at 505-827-0006. Generally, younger children in a child care center would be given chemoprophylaxis after an index case is identified.
References


Centers for Disease Control and Prevention. Recommendations for Use of Meningococcal Conjugate Vaccines. Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR 2011; 60(03); 72-76

What is a meningococcal Infection?
A type of bacteria called Neisseria meningitidis (also known as “meningococci”) cause meningococcal infections. A very small number of people exposed to these bacteria develop a serious illness from it, such as meningitis (inflammation of the lining of the brain and spinal cord) or bloodstream infections.

What are the symptoms of meningococcal infection?
Symptoms may include fever, chills, headache, muscle aches, stiff neck, nausea, vomiting, sleepiness or confusion, and/or a characteristic skin rash. Symptoms of infection may appear 1 to 10 days after exposure, but usually within four days.

How are meningococcal infections spread?
Meningococci are spread by direct contact with secretions from the nose and throat of an infected person. Spread is almost always by close contact with a person who is not ill (an asymptomatic carrier). Examples of close contact include kissing, or sharing drinking glasses, eating utensils, cigarettes or toothbrushes. Casual contact such as takes place in a classroom or office setting is not usually enough to spread disease. Meningococci can only live for a few minutes on environmental surfaces such as tables, chairs, and clothing.

How long are people contagious?
A person may spread the bacteria from the time that the person is first infected until the bacteria are no longer in the person’s nose and throat. Meningococci usually disappear from the nose and throat within 24 hours after the start of proper antibiotics.

Who gets meningococcal infections?
Anyone can get it, but it is more common in infants, children and young adults.

What treatment is available for people with meningococcal infections?
Antibiotics are used to treat meningococcal infections. However, even with proper antibiotics about 10% of the people who have a meningococcal infection die and 20% have permanent complications, such as hearing loss, brain injury, or loss of a limb.

Do infected people need to be kept home from school, work or daycare?
People who have a meningococcal infection will most probably be in the hospital. Persons infected with meningococci may spread the bacteria until 24 hours after proper antibiotics were started.

How can I protect myself and my family from getting a meningococcal infection?
- If you have been in close contact with the ill person, you will need to receive preventive antibiotics. In general, close contacts are household members, intimate contacts, and close friends. In these persons, the taking an antibiotic can get rid of the bacteria from the nose and throat. This lowers the chance for spreading the bacteria to others and may prevent illness.
- A vaccine is available that protects against certain strains of the bacteria. Vaccination is currently recommended for young adolescents at their routine preadolescent visit (11-12 years of age) as well as any unvaccinated adolescents at high school entry (15 years of age). It is also recommended for military recruits, college freshmen who are living in dormitories and persons with certain health conditions (e.g., damaged spleen.)
- Wash hands frequently with water and soap. Teach children to wash their hands too. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Always cover your nose and mouth when you cough or sneeze and then wash your hands.
¿Qué es una infección meningocócica?
Una infección meningocócica está causada por una bacteria llamada Neisseria meningitidis (también conocida como "meningococos"). Un número muy pequeño de personas expuestas a estas bacterias pueden desarrollar una enfermedad grave como la meningitis (inflamación del tejido que cubre el cerebro y la médula espinal).

¿Cuáles son los síntomas de una infección meningocócica?
Algunos de los síntomas son fiebre, escalofríos, dolor de cabeza, dolores musculares, rigidez del cuello, náuseas, vómitos, somnolencia o confusión, y la aparición de un sarpullido característico. Los síntomas pueden presentarse entre 1 y 10 días después de haber estado expuesto, pero suelen aparecer a los 4 días.

¿Cómo se transmite esta infección?
Los meningococos se transmiten por contacto directo con las secreciones de la nariz o la garganta de una persona infectada. La transmisión se produce casi siempre por contacto cercano con una persona que no está enferma (no tiene síntomas). Algunos ejemplos de contacto cercano son: besarse, compartir bebidas, utensilios para comer, cigarrillos o cepillos de dientes. Es difícil que se transmita por contacto casual, por ejemplo, en un salón de clase u oficina. Estas bacterias pueden vivir sólo unos minutos en superficies como mesas, sillas, ropa, etc.

¿Por cuánto tiempo puede alguien con una infección meningocócica contagiar a otros?
Una persona puede transmitir la bacteria desde el momento en que adquiere la infección hasta que las bacterias dejan de existir en su nariz y garganta. Los meningococos normalmente desaparecen de la nariz y la garganta 24 horas después de haber empezado el tratamiento con antibióticos.

¿Quién puede contraer una infección meningocócica?
Cualquiera puede contraerla, pero es más común en bebés, niños y jóvenes.

¿Cómo se trata una infección meningocócica?
Se usan antibióticos para tratar estas infecciones. Sin embargo, incluso con los antibióticos adecuados un 10% de las personas que tienen una infección meningocócica mueren y el 20% desarrollan complicaciones permanentes, como pérdida de oído, daño cerebral o pérdida de una extremidad.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Lo más probable es que las personas con esta infección estén en un hospital. Las personas infectadas pueden transmitir la bacteria hasta 24 horas después de haber empezado el tratamiento con antibióticos.

¿Cómo puedo protegerme yo y proteger a mi familia contra una infección meningocócica?
• Si tuvo contacto cercano con el enfermo, necesita recibir antibióticos preventivos. Por lo general los contactos cercanos son las personas que viven en la misma casa, contactos íntimos y amigos cercanos. Si estas personas toman antibióticos, se pueden deshacer de las bacterias presentes en la nariz y la garganta. Esto reduce la posibilidad de propagar la bacteria a otros y ayuda a prevenir la enfermedad.
• Hay una vacuna disponible que protege contra ciertos tipos de la bacteria. Hoy día, se recomienda que reciban la vacuna los adolescentes en su visita médica a los 11-12 años de edad y los adolescentes que van a entrar a la secundaria y que no estén vacunados (a los 15 años). También se recomienda para los militares, estudiantes universitarios de primer año que viven en dormitorios y para personas con ciertas condiciones médicas (por ejemplo, con enfermedades del bazo).
• Lávese bien las manos con frecuencia con agua y jabón, y enséñele a los niños a hacerlo también. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
• Siempre cubra su nariz y boca cuando tosa o estornude y lávese las manos después.
Methicillin-resistant *Staphylococcus aureus* (MRSA)

**Summary**

*Staphylococcus aureus* (*S. aureus*), a common commensal and human pathogen, can cause a variety of skin and soft tissue infections, invasive infections and toxin-mediated syndromes. Methicillin-resistant *S. aureus* (MRSA) are a subset of *S. aureus* that are resistant to beta-lactam antibiotics, except ceftaroline.

First reported in 1968, MRSA progressively became a major cause of infections among hospitalized patients, particularly among patients with one or more co-morbid conditions. MRSA infections in these populations have been referred to as health care-associated MRSA (HA-MRSA).

A new strain of MRSA (USA 300) began to appear in the community in 1999. By 2011, USA 300 was considered relatively widespread among healthy persons in the community. The term Community-associated MRSA (CA-MRSA) refers to MRSA infections acquired in the community without healthcare association.

**Agent**

*S. aureus* are gram-positive cocci that appear microscopically as grape-like clusters. *S. aureus* is one of the most commonly isolated bacterial pathogens in humans. It is an important cause of skin and soft tissue infections (SSTIs), endovascular infections, pneumonia, septic arthritis, endocarditis, osteomyelitis, sepsis, foreign-body and device related infections.

Methicillin-resistant *S. aureus* (MRSA) are resistant to beta-lactam antibiotics, including penicillinase-resistant penicillins (e.g., methicillin, oxacillin, nafcillin) and cephalosporins, with the exception of ceftaroline. HA-MRSA are typically resistant to multiple classes of antimicrobials. CA-MRSA are resistant to fewer non-Beta-lactam classes of antimicrobials than HA-MRSA.

**Transmission**

Reservoir:

A large percentage of the population harbors (60%) *S. aureus* intermittently, with a mean carriage state of 27-37%. Between 1 to 1.8% of the general population is colonized with MRSA. Colonization rates among healthcare workers is higher and probably in the 5-7% range. The anterior nares are colonized most densely, but the throat, axilla, perineum, vagina, and rectum are also common sites of colonization.

Mode of transmission:

Most often through direct skin-to-skin contact, but can be transmitted through contaminated surfaces or items, such as sports equipment, wound dressings, towels, or linens.

Period of communicability:

For as long as the organism is present; colonization is usually transient but may persist for years in 10% to 20% of affected persons.

**Clinical Disease**
Incubation period:

Variable. Some persons may be colonized with S. aureus or MRSA and never develop infection, while others may develop infection without evidence of prior colonization.

Illness:

In contrast with HA-MRSA, CA-MRSA infections tend to occur in healthy younger patients.

Most CA-MRSA infections are skin and soft tissue infections, such as abscesses and cellulitis. MRSA skin lesions are frequently confused with spider bites by both patients and clinicians. MRSA, like methicillin resistant S. aureus, can cause bacteremia, sepsis, pneumonia, septic arthritis, osteomyelitis, and other foci of infection. Risk factors for severe staphylococcal infections include surgery, transplantation, immune system disorders, and chronic diseases such as diabetes mellitus and cirrhosis of the liver.

HA-MRSA strains are typically seen among people with healthcare exposures. Patients with HA-MRSA tend to be older than individuals with CA-MRSA and often have one or more associated comorbidities. HA-MRSA can cause healthcare associated pneumonia, bacteremia, surgical infections, including orthopedic surgeries, device associated and invasive infections.

MRSA is the leading cause of healthcare-associated infections in neonatal intensive care units (NICUs). MRSA colonization is the greatest risk factor leading to infection. Colonized infants also serve as a potential reservoir for the transmission of MRSA through the hands of healthcare workers thus, leading to outbreaks. Active surveillance in ICUs has demonstrated to be effective decreasing the number of outbreaks, as a way of early identification for the implementation of infection control measures. At the time of this publication, it is estimated that less than half of US hospitals conduct active MRSA NICU surveillance.

Low birth weight, prematurity, caesarean section and prolonged lengths of stay predispose infants to colonization. The exact rates of horizontal MRSA transmission vary between institutions. Studies investigating transmission mechanisms reveal conflicting results. However, NICU events leading to transmission are deemed among the most important mechanisms for neonate acquisition of MRSA. Recent reports of increasing rates of CA-MRSA in the NICU do demonstrate that introduction of MRSA into the NICU may occur via multiple routes.

Laboratory Diagnosis

Gram-stained smears of material from lesions can provide presumptive evidence of infection. Isolation of S. aureus from culture is definitive. Molecular typing is a helpful tool investigating outbreaks. Refer to the Centers for Disease Control and Prevention (CDC) Guidelines on laboratory detection of MRSA for specific antimicrobial susceptibility testing recommendations, available at http://www.cdc.gov/mrsa.

Treatment

Many common skin infections caused by MRSA will heal without treatment. However, some SSTIs require incision and drainage, and some may require antibiotics. Oral antibiotics that may treat MRSA include clindamycin, azithromycin, macrolides, sulfamethoxazole/trimethoprim or oral quinolones with gram positive activity, such as levofloxacin. Variable susceptibility patterns exist. Serious MRSA infections, particularly those requiring hospitalization, may require intravenous antibiotic therapy. Intravenous antibiotics that may treat MRSA include vancomycin, daptomycin (excluding pneumonia), ceftaroline and linezolid (which is also available orally but should only be used for serious infections and for a limited amount of time). For detailed recommendations on the treatment of CA-MRSA infections, refer to CDC’s Strategies for...

**Surveillance**

**Reporting:**

Individual cases of MRSA infection are not reportable in New Mexico. Report suspected clusters or outbreaks of MRSA in any setting to the Epidemiology and Response Division at 505-827-0006.

**Control Measures**

1. **Case management**
   
   1.1. **Isolation:**
      
      1.1.a For the general population: None recommended. All wounds should be kept covered. Frequent hand washing, and good personal hygiene should be emphasized. Personal items such as razors, towels, and clothing should not be shared.
      
      1.1.b For primary and secondary school children: None recommended. All wounds should be kept covered. Frequent hand washing, and good personal hygiene should be emphasized. Personal items such as razors, towels, and clothing should not be shared.
      
      1.1.c For sports team participants: All wounds should be kept covered. If a wound cannot be covered adequately, consider excluding from practice and competitions until skin lesions have healed or can be covered adequately. Frequent hand washing, and good personal hygiene should be emphasized. Personal items such as razors, bar soap, towels, clothing, and equipment should not be shared.
      
      1.1.d For child care attendees and staff: All wounds should be kept covered. If a wound cannot be covered adequately, consider excluding until skin lesions have healed or can be covered adequately. Frequent hand washing, and good personal hygiene should be emphasized. Personal items such as razors, towels, clothing and equipment should not be shared.
      
      1.1.e For hospitalized patients: Patients infected or colonized with MRSA should be managed with contact precautions for multidrug-resistant organisms for the duration of illness. Guidelines from CDC are available at [http://www.cdc.gov/ncidod/dhqp/](http://www.cdc.gov/ncidod/dhqp/).
      
      1.1.f For patients in non-hospital health care settings (e.g., long-term care facilities, physicians’ offices, dialysis centers): Standard precautions should be used. Contact precautions may be considered in special situations, such as patients with draining wounds. Guidelines from CDC are available at [http://www.cdc.gov/ncidod/dhqp/ar_multidrugFAQ.html](http://www.cdc.gov/ncidod/dhqp/ar_multidrugFAQ.html).
      
      1.1.g For persons in correctional facilities, including prisons and jails: In general, inmates with non-draining wounds or wounds with minimal drainage, contained by a simple dressing, can be housed in general population. Factors entering into decisions about where to house inmates with MRSA infections include the degree to which wound drainage can be contained, the ability or willingness of an inmate to follow infection control instructions, and available housing options. Refer to the Federal Bureau of Prisons Clinical Practice Guidelines on management of MRSA infections for detailed guidelines on appropriate control measures ([http://www.bop.gov/news/medresources.jsp](http://www.bop.gov/news/medresources.jsp)).
1.2. Prophylaxis:

1.2.a Decolonization: The effectiveness of decolonization therapy of any kind for preventing S. aureus infections has not been well-established. Recolonization is common and development of resistance to systemic and topical agents during decolonization therapy has been described.

1.2.b Decolonization can be a useful tool to halt outbreaks. Mupirocin ointment application combined with chlorhexidine gluconate (CHG) bathing are the most frequently used interventions with demonstrated effectiveness. The safety of CHG has not been established for infants. The Food and Drug Administration has warned exercising caution when using CHG cloths in premature infants and all infants under 2 months.

1.2.c Decolonization has been found to be a successful tool decreasing surgical-associated MRSA infections, particularly Orthopedic and Cardiac surgery.

2. Contact management

2.1. Isolation: None required.

2.2. Prophylaxis: Not applicable.

3. Prevention

3.1. Keep draining wounds covered with clean, dry bandages. If wounds cannot be kept covered, do not participate in activities that involve skin-to-skin contact with other persons.

3.2. Clean hands regularly with soap and water or alcohol-based hand gel (if hands are not visibly soiled). Always clean hands immediately after touching infected skin or any item that has come in contact with a draining wound.

3.3. Maintain good general hygiene with regular bathing.

3.4. Do not share personal items such as towels, clothing, and bedding, bar soap, razors, and athletic equipment.

3.5. Launder towels, clothing and bedding that have come in contact with wound drainage after each use.

3.6. Clean equipment and environmental surfaces with which multiple persons have bare skin contact with an over the counter detergent/disinfectant that specifies Staphylococcus aureus on the label and is suitable for the type of surface.

3.7. Appropriate cleaning and disinfection of all medical equipment and inert surfaces is required of all healthcare organizations. This include elimination of possible biofilm formation. Terminal cleaning between patient use in acute care settings and residents of long term care facilities is essential to decrease rates of transmission. Adjuvant use of ultraviolet light devices or hydrogen peroxide vaporizers may serve a complementary role to appropriate cleaning and disinfection.

3.8. Active surveillance has a role in organizations where MRSA is prevalent. This may be a very effective way to decrease transmission in neonatal and adult ICUs.

3.9. Given the increasing rates of CA-MRSA in NICUs, depending on the organization, interventions to mitigate the introduction of MRSA in NICU should be considered. These may include routine screening and potential decolonization of parents and caregivers in the pre-natal and post-natal period.

3.10. Chlorhexidine bathing may also be a useful tool in adult ICUs.
3.11. The establishment of protocols for decolonization of patients colonized with MRSA prior to Cardiac or Orthopedic surgery should be considered by centers where these services are offered.

3.12. Immunization: Not applicable.

References


Centers for Disease Control and Prevention. Methicillin-resistant \textit{Staphylococcus aureus} Infections. Available at \url{http://www.cdc.gov/mrsa}

What is MRSA?

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of *Staphylococcus aureus* ("staph") bacteria. "Staph" is a common type of bacteria that may be frequently found on healthy persons’ skin and in their noses. It can also grow in sores or other sites in the body, sometimes causing an illness. Many people carry staph bacteria on their skin without any symptoms.

Penicillin is an antibiotic that was once commonly used to treat staph infections. Many staph bacteria are no longer killed by penicillin and antibiotics related to penicillin. These new or resistant forms of *Staphylococcus aureus* cause MRSA infections, and they require special medications because some antibiotic medications will not kill the bacteria. The illnesses they cause are the same as those caused by other staph. The difference is in how they are treated.

What are the symptoms of MRSA infection?

Frequently a MRSA infection looks like a pimple, rash, boil or an open wound. Sometimes people think it is a spider bite. The skin infection caused by MRSA can have redness, warmth, swelling, pus and/or pain. If not treated properly, MRSA skin infection may progress quickly from a soreness of the skin to an abscess or other serious body infection.

How is MRSA spread?

MRSA lives on skin and can live on objects for 24 hours or more. Drainage or pus from skin lesions can spread MRSA bacteria to other parts of a person’s body or to other persons. MRSA can rub off the skin of an infected person onto the skin of the other person during body contact. MRSA can also come off the infected skin of a person onto a shared object or surface and get onto the skin of the next person who uses it. Examples of shared objects include razors, towels, clothing and sporting equipment.

How long are people contagious?

Persons can spread MRSA as long as they are carrying it.

Who gets MRSA?

Anyone can get MRSA. Just like normal staph bacteria, MRSA normally does not cause disease unless it enters an opening in the skin. Some people are at a greater risk for carrying MRSA or becoming infected with this type of “staph.” It occurs more frequently in people in hospitals and health care facilities. However, it can also happen outside the hospital in people who either receive multiple antibiotics or come in frequent contact with the germ. This may occur when they have close contact with a person carrying the bacteria or by touching objects “dirtied” or contaminated with MRSA (e.g., clothes, towels, bedding, sporting equipment, benches in saunas or hot tubs, bandages). Crowded living conditions (e.g., schools, jails) and poor hygiene can contribute to the spread of MRSA infections.

What treatment is available for people with MRSA?

Early treatment can help prevent the infection from getting worse. If you have a bad abscess, the doctor should drain the pus. If you are given medicine, be sure to take all of your pills. Be sure to follow directions from your health care provider, even when you start to feel better.

Do infected people need to be kept home from school, work or daycare?

No. Persons with MRSA skin infections should keep the infected area covered with clean, dry pads. They may need to avoid certain activities such as gym class to prevent the covering from coming off.

How can I protect myself and my family from getting MRSA?

- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Keep cuts and scrapes clean with soap and water.
- Do not pick, touch, or scratch your skin infections or touch someone else’s sores.
- Avoid skin contact and sharing personal items with anyone you think could have an MRSA skin infection.
- Don’t insist on antibiotics for colds or other viruses.
- If prescribed antibiotics, take all the pills, even if you feel better before they are all gone.
¿Qué es el SARM?
El Staphylococcus aureus es un tipo de bacteria (estafilococo). SARM son las iniciales de Staphylococcus aureus resistente a la meticilina (en inglés MRSA). Los estafilococos son un tipo común de bacteria que se encuentra con frecuencia en la piel y en la nariz de las personas sanas. También pueden aparecer en heridas u otras partes del cuerpo, a veces causan una infección. Muchas personas tienen la bacteria en su piel sin ningún síntoma. Antes lo normal era usar la penicilina para tratar las infecciones por estafilococos. Ahora muchas de estas bacterias de estafilococos no responden al tratamiento con penicilina ni con otros antibióticos relacionados. Estas nuevas formas o resistentes de Staphylococcus aureus causan las infecciones por SARM y necesitan tratarse con medicación especial porque algunos antibióticos no pueden matar esta bacteria. Las enfermedades que causan son las mismas que las causadas por otros estafilococos, pero su tratamiento es diferente.

¿Cuáles son los síntomas de una infección por SARM?
Normalmente esta infección parece como un grano, un sarpullido o una herida abierta. A veces, se puede pensar que es una picadura de araña. La infección en la piel causada por SARM puede presentar enrojecimiento, sensación de calor, hinchazón, pus o dolor. Si no se trata adecuadamente, la infección puede progresar rápidamente de una herida en la piel a un absceso u otra infección grave en el cuerpo.

¿Cómo se transmite el SARM?
El SARM vive en la piel y puede vivir en objetos durante 24 horas o más. El líquido o pus de las heridas pueden transmitir la bacteria a otras partes del cuerpo de la misma persona o a otras personas. Cuando hay contacto corporal, por ejemplo, al frotrase, el SARM puede despegarse de la piel de la persona infectada y pasar a la otra persona. También puede despegarse la piel de la persona infectada y pasar a un objeto o superficie y de ahí a la piel de la persona que lo use después. Algunos ejemplos de objetos compartidos son: cuchillas de afeitar, toallas, ropa y equipo deportivo.

¿Por cuánto tiempo puede una persona con esta infección contagiar a otros?
Las personas pueden transmitir el SARM mientras lo tengan en su cuerpo.

¿Cómo se trata el SARM?
El tratamiento temprano puede ayudar a que la infección no empeore. Si la herida tiene pus, el médico debe eliminar el pus. Si le dan medicinas, asegúrese de tomar todas las pastillas. Siga las instrucciones de su médico, incluso cuando empiece a sentirse mejor.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
No. Las personas solo deben mantener el área infectada cubierta con gasas limpias y secas. Posiblemente deban evitar ciertas actividades como clases donde hagan ejercicio físico para que no se caiga la gasa que cubre la herida.

¿Cómo puedo protegerme yo y proteger a mi familia contra esta infección?
- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Mantenga cualquier corte o rasguño limpio con agua y jabón.
- No se toque ni se rasque las infecciones que tenga en la piel, tampoco toque las heridas de otras personas.
- Evite el contacto con la piel de una persona que pueda tener una infección por SARM y no compartan objetos con ella.
- No insista en tomar antibióticos para resfriados u otros virus.
- Si le recetan antibióticos, tome todas las pastillas, incluso si se siente mejor antes de terminarlas todos.
Monkey Bites - Herpes B Virus

Monkeys carry many diseases that infect humans. Exposure to monkey bites and scratches puts one at risk for herpes B virus and rabies. Rabies prophylaxis – Monkey bite victims usually need rabies post-exposure prophylaxis. Please refer to rabies chapter in this manual for more information.

Herpes B virus is a dangerous infection that occurs in Macaque monkeys. There are reports of fatal cases in humans of myelitis and hemorrhagic encephalitis caused by herpes B virus transmitted from Macaque monkeys. Persons at greatest risk for B virus infection are travelers, veterinarians, laboratory workers, and others who have close contact with Old World macaques or monkey cell cultures. Infection is typically caused by animal bites or scratches, exposure to the tissues or secretions of macaques, or mucosal contact (contact with the eyes, nose or mouth with infected body fluid or tissue). Human infection can also result from indirect contact via needlestick injury from a contaminated needle.

Macaques housed in primate facilities usually become B virus positive by the time they reach adulthood. B virus establishes latent infection in macaques and can only be transmitted during active viral shedding into mucosal surfaces. Although rare viral shedding occurs after reactivation from the latent state, most commonly in animals that have been stressed or immunosuppressed. In nature, Old World macaques are found in Central and Southeast Asia along with Barbary macaques in North Africa and Gibraltar.

Identification of the species of primate that bit a person should be made from geographic location and description of the animal, including any pictures.

Wound Management

The treating healthcare provider should assess and treat the scratch or bite as needed. Most of the time, however, the on-call epidemiologist will be learning about the exposure once the bite victim has returned from travel to a foreign country. Usually wound care will have been rendered in the country where the bite occurred. In the event that the bite occurred in the United States, or
the bite victim did not receive wound care, monkey bites tend to be puncture bites so closure of the wound with sutures is generally not recommended. The healthcare provider will decide the course of antibiotic treatment, need for debridement or other wound care measures. Ensure the bite victim is up-to-date with tetanus vaccine.

**Herpes B (Cercopithecine herpes) prophylaxis considerations and recommendations.**

**Type and physical condition of the implicated animal.** Only monkeys of the macaque family serve as the natural reservoir for B virus infection. No other primates carry any risk of B virus transmission unless they have had the opportunity to become infected by a macaque. Infected macaques will not ordinarily be shedding B virus. Animals with lesions consistent with B virus infection (fluid-filled blisters on the skin) and animals that are immunocompromised or stressed are more likely to be shedding virus.

2. **Thoroughness and timeliness of wound cleansing procedure.** Wounds that have been cleansed within 5 minutes of exposure and that have been cleansed for at least 15 full minutes are less likely to lead to B virus infection. Delay in cleansing or inadequate cleansing of the wound increases the risk of infection.

3. **Nature of the wound.** Bites or scratches that penetrate the skin, and particularly deep puncture wounds, are higher risk than wounds that are superficial and more easily cleansed. Wounds to the head, neck, or torso provide rapid access to the CNS and should be considered higher risk. Prophylaxis is recommended for this type of wound regardless of its severity. Superficial wounds to the extremities are less likely to lead to fatal disease, and antiviral treatment is considered less urgent in such exposures.

4. **Exposure to materials that have come into contact with macaques.** Needlesticks with syringes that have come into contact with the CNS, eyelids, or mucosa of macaques carry a high risk of infection. Accidental punctures from needles exposed to the peripheral blood of macaques are considered relatively low risk. Scratches resulting from contact with possibly contaminated objects, such as animal cages, carry a lower risk for infection. It should be stressed, however, that in none of these potential exposures, can the risk of infection be considered zero. The decision to treat with antivirals should be made at the physician's discretion, with consideration of the patient’s wishes and concerns.

**Treatment should be considered in the following circumstances:**

1. Mucosal splash that has been inadequately cleaned.
2. Laceration (loss of skin integrity) that has been adequately cleaned.
3. Needlestick involving blood from an ill or immunocompromised macaque.
4. Puncture or laceration occurring after exposure to (a) objects contaminated with body fluid (other than that from a lesion) or (b) a possibly infected cell culture.

**Treatment is not recommended in the following circumstances:**

1. Skin exposure in which the skin remains intact.
2. Exposure associated with non-macaque species of non-human primates, unless they were in a situation where they could have been infected by a macaque.

**Antiviral Therapy**

Recommended dosages for specific antivirals are as follows.

1. **Prophylaxis for exposure to B virus**
   - Valacyclovir—1g by mouth every 8 hours for 14 days, or
If the bite victim develops any neurological symptoms in the next few days to five weeks after the bite, she should be referred to a higher level of care for further evaluation and treatment.

2. Treatment of B virus infection

   With no CNS symptoms
   
   - Acyclovir—12.5–15 mg/kg intravenously every 8 hours, or
   - Ganciclovir—5 mg/kg intravenously every 12 hours.

   With CNS symptoms
   
   - Ganciclovir—5 mg/kg intravenously every 12 hours.
Mosquito-Borne Viral Encephalitides

Summary

The mosquito-borne viruses, or arboviruses, are a group of illnesses that are primarily transmitted through the bite of an infected mosquito. The diseases of this group that have been transmitted in New Mexico are Western equine encephalitis (WEE), St. Louis encephalitis (SLE), and West Nile virus (WNV). Travelers to endemic areas can be exposed to other arboviral illnesses such as dengue (DEN), chikungunya (CHIK), or Zika (ZIK) viruses. The majority of arboviral infections are asymptomatic or mild. Fever is the most common symptom, with others including myalgia, arthralgia, and rash. When there is central nervous system involvement, aseptic meningitis or encephalitis may occur and can cause altered mental status, coma, or death. The elderly are at greatest risk of severe illness with SLE and WNV. Neurologic sequelae are most severe in children infected with WEE. Zika virus is the only arbovirus known to cause birth defects in fetuses whose mother was infected during pregnancy, and is also the only arbovirus with documented sexual transmission. Control of these diseases is primarily through effective mosquito control and personal protective measures to prevent mosquito bites.

Agent

Each disease is caused by a specific virus: Western equine encephalitis and chikungunya viruses are in the family Togaviridae (Alphavirus); St. Louis encephalitis, dengue, Zika and West Nile viruses are in the family Flaviviridae (Flavivirus).

Transmission

Reservoir host:

- Birds are the source of WNV, WEE, and SLE infection for feeding mosquitoes during active transmission (usually summer and early fall). Little is known about the overwintering mechanisms for these viruses. The virus may remain viable in infected hibernating adult female mosquitoes, birds or other animals.
- Primates, including humans, are the reservoir for CHIK, DEN, and ZIK.

Vector:

- In the United States mosquito species in the genus Culex are the principal vectors of WEE, WNV and SLE.
- DEN, CHIK, and ZIK could potentially be vectored by invasive Aedes aegypti and A. albopictus mosquitoes, which are present in some southern areas of New Mexico.

Mode of transmission:

- Through the bite of infected mosquitoes that have acquired the virus by feeding on an infected reservoir host. Rarely, organ and tissue transplant or blood transfusion can also cause infection. The blood supply of the United States is screened for arboviruses.
- Zika virus can also be spread through unprotected sexual contact and from a pregnant person to a fetus.
Period of communicability:

With the exception of ZIK, these viruses are not transmissible from human to human or from other animals to humans. Zika virus may be spread through unprotected sexual contact with an infected female partner for up to two months after exposure or onset, and with an infected male partner for up to three months after exposure or onset.

Clinical Disease

Incubation period:

Usually 2-14 days, up to 21 days for SLE or for WNV in immunocompromised people.

Illness:

Locally acquired disease in humans is most common in summer and early fall. Symptoms are variable depending on the virus and the age and general health of the individual. Mild cases often present as a febrile headache or aseptic meningitis. Severe infections are usually marked by acute onset of headache, high fever, meningeal signs, altered mental status, disorientation, coma, tremors, occasional convulsions (especially in infants), and spastic or flaccid paralysis. Case fatality rates range from 2% – 20%, and the ratio of asymptomatic infections to clinical cases can be quite high (about 80% of infections are asymptomatic). Signs and symptoms of SLE and WNV are most severe in persons >50 years of age. Adults usually recover completely from WEE, but about half of children affected with WEE suffer permanent neurological effects, including progressive mental retardation and varying degrees of physical and mental dysfunction. ZIK is usually a mild illness with very few hospitalizations or deaths; however, infection during pregnancy can cause microcephaly, eye/ear problems, and other congenital defects in the fetus. Severe DEN infection may cause plasma leakage, shock, severe bleeding, and multiorgan failure.

Horses suffer clinical disease with WEE or WNV infection. Some bird species infected with WNV can become sick and die, unlike infections with SLE or WEE.

Laboratory Diagnosis

Patients with consistent signs and symptoms and compatible travel or exposure history in which diagnosis of an arboviral infection is highly suspected should have blood and possibly cerebrospinal fluid (CSF, if signs or symptoms of neuroinvasive disease are present) collected for testing.

Commercial laboratories in New Mexico and other states are able to test serum and/or CSF specimens. Typical patients to test include:

- Any patient with encephalitis, or atypical Guillain-Barre type syndrome and evidence of pleocytosis in the CSF.
- Any patient with suspect viral meningitis if other etiologic agents have been ruled out.
• Pregnant women who resided in or traveled to a Zika virus endemic area and had symptoms of fever, rash, headache, or arthralgia within 2 weeks of exposure.

In cases with atypical laboratory results, New Mexico Department of Health Scientific Laboratory Division (SLD) may forward samples to CDC in Ft. Collins, Colorado for further testing. Call the Epidemiology and Response Division at 505-827-0006 prior to shipment of any specimens. A submission form with brief clinical information will need to be completed.

**Treatment**

No antiviral medication is available for any of these arboviruses. Supportive therapy is indicated, and patients should be monitored for cerebral edema. DEN patients should avoid medications containing ibuprofen, Naproxen, or aspirin.

Dengue hemorrhagic fever generally requires hospitalization and may be treated using fluid replacement therapy.

**Surveillance**

**Case Definition:**

**Clinical case definition**-

Patients must have a compatible exposure or travel history in addition to clinical signs.

A clinically compatible case of arboviral disease is defined as follows:

**Neuroinvasive disease**

- Meningitis, encephalitis, acute flaccid paralysis, or other acute signs of central or peripheral neurologic dysfunction, as documented by a physician, and
- Absence of a more likely clinical explanation. Other clinically compatible symptoms of arbovirus disease include: headache, myalgia, rash, arthralgia, vertigo, vomiting, paresis and/or nuchal rigidity.

**Non-neuroinvasive disease**

- Fever (chills) as reported by the patient or a health-care provider (with the exception of ZIK, which does not always present with fever and can be suspected in the presence of at least one clinical symptom), and
- Absence of neuroinvasive disease, and
- Absence of a more likely clinical explanation. Other clinically compatible symptoms of arbovirus disease include: headache, myalgia, rash, arthralgia, vertigo, vomiting, paresis and/or nuchal rigidity.

**Laboratory criteria:**

Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, CSF, or other body fluid, or

- Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, or
- Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen, or
• Virus-specific IgM antibodies in CSF or serum.

**Case Classification**

*Probable*

**Neuroinvasive disease**

A case that meets the above clinical criteria for neuroinvasive disease and the following laboratory criteria:

• Virus-specific IgM antibodies in CSF or serum but with no other testing.

**Non-neuroinvasive disease**

A case that meets the above clinical criteria for non-neuroinvasive disease and the laboratory criteria for a probable case:

• Virus-specific IgM antibodies in serum but with no other testing.

*Confirmed*

**Neuroinvasive disease**

A case that meets the above clinical criteria for neuroinvasive disease and one or more of the following laboratory criteria for a confirmed case:

• Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, CSF, or other body fluid, or

• Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, or

• Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen, or

• Virus-specific IgM antibodies in CSF, with or without a reported pleocytosis, and a negative result for other IgM antibodies in CSF for arboviruses endemic to the region where exposure occurred.

**Non-neuroinvasive disease**

A case that meets the above clinical criteria for non-neuroinvasive disease and one or more of the following laboratory criteria for a confirmed case:

• Isolation of virus from, or demonstration of specific viral antigen or nucleic acid in, tissue, blood, or other body fluid, excluding CSF, or

• Four-fold or greater change in virus-specific quantitative antibody titers in paired sera, or

• Virus-specific IgM antibodies in serum with confirmatory virus-specific neutralizing antibodies in the same or a later specimen.

**Reporting:**

Report all suspected or confirmed cases of encephalitis to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

Use the Arbovirus Case Report Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.
Control Measures

1. Case management

1.1. Isolation: Isolation of patients with mosquito-borne encephalitis is not required.

Contact precautions are appropriate until bacterial meningitis is ruled out. Patients suspected of having DEN, CHIK, or ZIK should take measures to avoid mosquito bites during their viremic period (approximately 7 days after illness onset). Humans and horses are dead-end hosts for WNV, WEE, and SLE and therefore cannot pass the infection to mosquitoes that feed on them. ZIK patients should also use barrier protection with sex partners (8 weeks for females, 6 months for males) and avoid pregnancy during that time.

2. Contact management

2.1. Isolation: None required. DEN, CHIK, and ZIK patients should avoid exposure to mosquitoes.

2.2. Prophylaxis: Not applicable.

3. Prevention

3.1. Immunization: No vaccine is available for humans. Horses should be vaccinated annually against Western equine encephalitis, Eastern equine encephalitis, West Nile virus, and Venezuelan equine encephalitis.

3.2. Control mosquito vectors through elimination of breeding sites (i.e., standing water). Educate the public on potential backyard sources of mosquito breeding such as discarded tires, abandoned swimming pools, and other water-holding containers.

3.3. Conduct larval and adult mosquito control through community vector control programs.

3.4. Screen windows and doors of houses and buildings.

3.5. Avoid exposure to mosquitoes during hours of biting. If mosquitoes cannot be avoided, wear long sleeves and long pants and apply an effective repellent (such as DEET [chemical name, N, N-diethyl-meta-toluamide] or picaridin) to exposed skin or clothing. Do not apply repellents under clothing. Use the lowest concentration of DEET that is effective (usually 10 – 35%). Use products containing no more than 10% DEET on children and do not apply DEET-containing products to children less than two months of age. Permethrin is an effective repellent used on clothing. Do not apply Permethrin to skin. Products containing botanical essential oils (such as lemon eucalyptus oil) are also available as mosquito repellents but need to be applied more frequently than DEET-containing repellents.

3.6. Surveillance and testing of mosquito vector populations has value by identifying rates of infection and geographic areas involved.

References


WEST NILE VIRUS

What is West Nile virus?
West Nile virus infection is spread by the bite of infected mosquitoes. Most of the time, the virus causes a mild illness. Rarely it can cause encephalitis (inflammation of the brain), meningitis (inflammation of the lining of the brain and spinal cord) or paralysis.

What are the symptoms of West Nile virus?
Symptoms usually begin about 2 to 14 days after exposure. In some people, especially those with weak immune systems, it can take as long as 21 days after exposure for symptoms to appear. On the other hand, healthy people may not have any symptoms. The disease can be mild or serious. Mild illness includes fever, muscle aches, fatigue, and sometimes a skin rash. In more severe cases of illness, the infection may spread to the nervous system. This can cause high fever, intense headache, a stiff neck and confusion. Serious illness can result in encephalitis or meningitis.

How is West Nile virus infection spread?
The bite of an infected mosquito is the most common way West Nile virus is spread. Mosquitoes become infected after biting a bird that carries the virus. West Nile virus is not spread from person to person. It is not spread directly from birds to humans. Blood transfusions and organ transplants have caused some infections. The risk of an infected mother spreading West Nile virus to her fetus or through breastfeeding is very low.

How long are people contagious?
People are not contagious.

Who gets West Nile virus?
Anyone can get West Nile virus, but people 50 and older are at greater risk. A person who gets West Nile virus probably cannot get it again.

What treatment is available for people with West Nile virus?
There is no specific treatment. Since West Nile virus infection is not caused by bacteria, antibiotics will not work to treat the patient. Instead doctors will try to reduce the symptoms with other medicines. Most people recover from this illness. There is no vaccine for humans.

Do infected people need to be kept home from school, work or daycare?
Since people with West Nile virus cannot spread it to other people, they can return to work or school as soon as they feel well enough.

How can I protect myself and my family from getting West Nile virus?
Protect against mosquito bites in the following ways:
- Wear long, loose and light-colored clothing.
- Reduce your time outdoors when mosquitoes are biting, especially at dawn and dusk.
- Use insect repellent. Follow the product’s directions for use.
  Control the mosquito population:
- Turn over or do away with containers (e.g. potted plant trays, old tires, and toys) in your yard where water might collect.
- Clean out birdbaths and wading pools at least once a week.
- Get rid of standing water (e.g. on tarps or flat roofs.)
- Clean roof gutters and downspout screens.
  Do not handle dead birds with your bare hands. Wear gloves and either throw the dead bird away or bury it. Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
¿Qué es el virus del Nilo occidental?
El virus del Nilo occidental se transmite por la picadura de mosquitos infectados. Muchas veces, el virus causa una enfermedad de carácter leve, pero también puede ocasionar encefalitis (inflamación del cerebro), meningitis (inflamación del tejido que cubre el cerebro y la médula espinal) o parálisis similar a la causada por la polio.

¿Cuáles son los síntomas del virus del Nilo occidental?
Los síntomas suelen aparecer de 2 a 14 días después de haber estado expuesto. En algunas personas, especialmente aquellas cuyo sistema inmunológico se encuentra debilitado, los síntomas pueden tardar hasta 21 días en aparecer. Por otra parte, las personas de buena salud pueden no tener ningún síntoma. La enfermedad puede ser de carácter leve o muy grave. Si es de carácter leve, los síntomas son: fiebre, inflamación de los ganglios linfáticos, dolores musculares y, a veces, aparece un sarpullido. En casos más graves, la infección puede pasar al sistema nervioso o a la sangre. Esto puede causar fiebre alta, dolor de cabeza intenso, rigidez en el cuello y confusión. Si la enfermedad es de carácter muy grave puede resultar en meningitis o encefalitis.

¿Cómo se transmite la infección del virus del Nilo occidental?
Generalmente, el virus del Nilo occidental se transmite por la picadura de un mosquito infectado. Los mosquitos contraen la infección cuando se alimentan de un pájaro infectado que es portador del virus. El virus del Nilo occidental no se transmite de persona a persona. No se transmite directamente de los pájaros a las personas. Se han producido algunas infecciones por medio de trasplantes y transfusiones de sangre. No está claro si el virus se puede transmitir de madre a hijo durante el embarazo o la lactancia.

¿Por cuánto tiempo puede alguien contagiar a otros?
Las personas no son contagiosas, es decir, no pueden pasar el virus a otros.

¿Quién puede contraer el virus del Nilo occidental?
Cualquier persona puede contraer este virus, pero las personas mayores de 50 años tienen un mayor riesgo. Es probable que una persona que ya tuvo el virus del Nilo occidental, no lo vuelva a tener otra vez.

¿Cómo se trata el virus del Nilo occidental?
No hay un tratamiento específico. Como el virus del Nilo occidental no lo causa una bacteria, los antibióticos no sirven para tratar al paciente. En su lugar, los médicos intentarán aliviar los síntomas con otras medicinas. La mayoría se recupera de esta enfermedad. No hay una vacuna para las personas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Como las personas infectadas con el virus del Nilo occidental no lo pueden transmitir a otras personas, pueden regresar a su trabajo o a la escuela cuando se sientan bien para hacerlo.

¿Cómo puedo protegerme yo y también proteger a mi familia contra el virus del Nilo occidental?
Para protegerse contra las picaduras de mosquitos, haga lo siguiente:
- Lleve ropa que le cubra (de manga larga y pantalones largos), de colores claros y que le quede suelta.
- Pase poco tiempo al aire libre cuando más pican los mosquitos (por ejemplo, en la noche).
- Use un repelente de insectos. Siga las instrucciones de uso del producto.
- Para controlar la población de mosquitos, haga lo siguiente:
  - Voltee o elimine los recipientes que tenga afuera en los que se pueda acumular el agua (como por ejemplo maceteros, llantas viejas y juguetes).
  - Vacíe y limpie a fondo los bebederos de animales y reservorios de agua al menos una vez por semana.
  - Elimine el agua que se quede en lonas o en techos planos.
  - Limpie las canaletas que eliminan el agua del techo y también todas sus partes.
- No manipule pájaros que estén muertos sin cubrir sus manos. Use guantes y tire el pájaro muerto o entiérello. Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
What is Zika virus (ZIKV)?
Zika virus infection is caused by the Zika virus.

What are the symptoms of Zika virus infection?
Most people infected with the Zika virus will not have any symptoms. Those who do may have
- Fever.
- Rash.
- Headache.
- Joint pain.
- Conjunctivitis (red eyes.)
- Muscle pain.
- Infection during pregnancy can cause microcephaly and other birth defects in the fetus.

How is Zika virus spread?
Zika virus is usually spread through the bite of an infected mosquito. Only certain kinds of mosquitoes can spread the virus (Aedes aegypti and Aedes albopictus). The virus can also be spread through sex from a person with Zika virus infection to his or her partners, even if the infected person has no symptoms. A pregnant person can pass the virus to her fetus. Transmission through transplants and blood transfusions have been documented but are extremely rare. The donated blood supply in the United States is screened for Zika virus.

How long are people contagious?
A person infected with Zika virus should strictly avoid mosquito bites for the first week after getting sick or for three weeks after returning from an area with Zika virus so that they do not pass the virus to mosquitoes which could bite other people. Men with Zika virus can pass the infection to their partners through sex for three months, and women with Zika virus can pass the virus to their partners through sex for two months.

Who gets Zika virus?
Most people who get Zika virus have lived in or traveled to an area where the virus is present and have been bitten by infected mosquitoes. Some people contract Zika virus through unprotected sex with a partner who has Zika virus. A pregnant woman can pass Zika virus infection to her fetus.

What treatment is available for people with Zika virus?
There is no vaccine and no specific treatment for Zika virus. Treatment of symptoms is recommended including plenty of rest, fluids, and medicines to reduce fever and pain. Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDS) should be avoided until dengue virus infection can be ruled out.

Do infected people need to be kept home from school, work or daycare?
No, however people potentially exposed to Zika virus should take strict precautions against mosquito bites for the first week of illness or three weeks after returning from an area with Zika virus.

How can I protect myself and my family from getting Zika virus?
- Pregnant women should avoid travel to areas with Zika virus if possible.
- Zika virus and many other diseases can be prevented by avoiding mosquito bites.
- People who have lived in or traveled to an area with Zika virus should practice abstinence or use barrier protection with pregnant sex partners for the duration of the pregnancy and should consider doing the same with non-pregnant sex partners for three months if male or two months if female after symptoms of or exposure to Zika virus.
- People with Zika virus should take strict precautions against mosquito bites for the first week of illness.
- People who have traveled to an area with Zika virus should strictly avoid mosquito bites for three weeks after returning.
¿Qué es el Zika?
El virus del Zika causa la enfermedad del Zika.

¿Cuáles son los síntomas del Zika?
La mayoría de las personas infectadas no muestran síntomas. Las personas sintomáticas pueden tener fiebre, zarpullido, dolores de cabeza, dolores en las articulaciones, conjuntivitis, dolores musculares,
La infección durante el embarazo puede ocasionar microcefalia y otros defectos de nacimiento en el feto

¿Cómo se transmite el Zika?
El virus del Zika se transmite usualmente por la picadura de un mosquito. Solo un cierto tipo de mosquitos puede trasmitir el Zika (Aedes aegypti and Aedes albopictus). El virus también se puede transmitir a través del sexo, incluso si la persona infectada no tiene síntomas. Una mujer embarazada puede pasarle el virus al feto. Se ha documentado también la transmisión del virus a través de trasplantes y transfusiones de sangre, pero esto es más raro. Los bancos de sangre en los Estados Unidos son monitoreados para el virus del Zika.

¿Por cuánto tiempo puede alguien con Zika contagiar a otros?
Las personas que están infectadas con el virus del Zika deben evitar ser picadas por mosquitos de manera estricta por la primera semana luego de enfermarse o por las tres semanas después de haber regresado de viaje de una zona con Zika, de manera de evitar pasarle el virus a los mosquitos de la zona que pueden a su vez picar a otras personas. Los hombres con Zika pueden pasar el virus a través del sexo por tres meses, y las mujeres con Zika pueden transmitir el virus a sus parejas por el sexo por dos meses.

¿Quién puede contraer el Zika?
La mayoría de las personas con Zika han vivido o viajado a una zona donde el virus está presente y han sido picadas por mosquitos infectados. Algunas personas contraen el virus al tener sexo sin protección con una pareja infectada con el virus. Una mujer embarazada puede pasarle el virus del Zika a su feto.

¿Cómo se trata el Zika?
No hay una vacuna ni tratamiento específico para el virus del Zika. Se recomienda tratar los síntomas, incluyendo descanso, bastantes líquidos, y con medicinas para reducir la fiebre y el dolor. Sin embargo, se debe evitar tomar aspirinas u otras medicinas antiinflamatorias no-esteroides (NSAIDS, por las siglas en inglés) hasta que no se haya descartado infección con dengue.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
No, sin embargo, las personas que hayan estado potencialmente expuestas al Zika deben evitar a toda costa ser picados por mosquitos durante la primera semana luego de enfermarse o por tres semanas luego de regresar de viaje de una zona con Zika.

¿Cómo puedo protegerme y también proteger a mi familia contra el Zika?
- Las mujeres embarazadas deben evitar viajar a zonas con Zika, si es posible.
- El virus del Zika y muchos otros se puede evitar al prevenir las picaduras de mosquitos.
- Las personas que hayan vivido o viajado a una zona con Zika deben practicar la abstinencia sexual o usar condones al tener sexo con parejas embarazadas durante toda la duración del embarazo, y deben considerar hacer lo mismo con parejas sexuales no embarazadas por tres meses después de tener síntomas o haberse expuesto al Zika si son hombres o dos meses si son mujeres.
- Las personas con Zika deben tomar estrictas precauciones para evitar las picaduras de mosquitos durante la semana de su enfermedad. Las personas que hayan viajado a una zona con Zika deben evitar estrictamente las picaduras de mosquitos por tres semanas luego de regresar de viaje.
Mumps

Summary
Mumps is an acute viral disease characterized by fever and swelling of one or more of the salivary glands (usually the parotid gland in 30% to 40% of infected persons) or reproductive glands. Mumps typically occurs in childhood. Infection among adults is more likely to be severe. Diagnosis is made clinically and confirmed using serology or culture. Treatment is supportive.

Agent
Mumps virus is an RNA virus of the genus Rubulavirus in the Paramyxovirus family.

Transmission
Reservoir:
Humans.
Mode of transmission:
Airborne transmission or droplet spread and by direct contact with the saliva of an infected person.
Period of communicability:
From 7 days prior to onset of parotitis to 5 days after onset of gland swelling. Patients are most infectious from 1-2 days before to 5 days after onset of gland swelling.

Clinical Disease
Incubation period:
The incubation period of mumps is 16 to 18 days (range is 12 to 25 days).
Illness:
Acute onset of mild to moderate tender swelling of one or more salivary glands, usually the parotid. As many as 30% of mumps infections are asymptomatic or present as respiratory tract infection. Central nervous system (CNS) involvement in the form of aseptic meningitis (inflammatory cells in cerebrospinal fluid) is common. Symptomatic meningitis (e.g., headache, stiff neck) occurs in less than 10% of patients and resolves without sequelae in 3 to 10 days. Adults are at higher risk for this complication than children, and boys are more commonly affected than girls (3:1 ratio). Parotitis may be absent in as many as 50% of such patients. Encephalitis is rare (less than 2 per 100,000 mumps cases).

Orchitis, testicular inflammation, is the most common complication in post pubertal males. It occurs in as many as 50% of post pubertal males, usually after parotitis, but it may precede it, begin simultaneously, or occur alone. It is bilateral in approximately 30% of affected males. There is usually abrupt onset of testicular swelling, tenderness, nausea, vomiting, and fever. Pain and swelling may subside in one week, but tenderness may last for weeks. Approximately 50% of patients with orchitis have some degree of testicular atrophy, but sterility is rare.

Oophoritis, ovarian inflammation, occurs in 5% of post-pubertal females. It may mimic appendicitis. There is no relationship to impaired fertility.
Pancreatitis is infrequent, but occasionally occurs without parotitis. Hyperglycemia may occur but is transient and is reversible.

Other complications that may occur include thyroiditis, mastitis, arthritis, glomerulonephritis, myocarditis, and thrombocytopenia.

**Laboratory Diagnosis**

- A swab from the parotid duct or other affected salivary gland ducts for viral isolation and/or reverse transcriptase-polymerase chain reaction (RT-PCR) testing is the preferred sampling method for mumps. Urine samples are no longer recommended. Mumps virus can also be detected from buccal swabs, throat washings, saliva or spinal fluid.

- If indicated for epidemiologic purposes, the New Mexico Department of Health Scientific Laboratory Division offers testing for the mumps virus by culture.

- Serum to test for mumps-specific IgM antibody should be collected within 5 days of illness onset. If the IgM antibody titer is negative, a second (convalescent) serum specimen for IgM antibodies is recommended 2--3 weeks after onset of signs (e.g., parotitis) or symptoms; a delayed IgM response has been observed in patients with confirmed cases of mumps, especially in vaccinated persons. The paired serum specimens also can be used to detect a significant rise (as defined by the testing kit instructions) in immunoglobulin G (IgG seroconversion) if measured by enzyme-linked immunosorbent assay or a fourfold rise in titer if measured using plaque-reduction neutralization assays or similar quantitative assay.

- A negative IgM result in vaccinated persons should not be used to rule out a mumps diagnosis. In the absence of another diagnosis, cases meeting the clinical case definition should be reported.

- Clinical samples should be obtained within 1-3 days after onset of parotitis.

**Treatment**

Supportive.

**Surveillance**

*Case Definition:*

*Confirmed –*

- A positive mumps laboratory confirmation for mumps virus with reverse transcription polymerase chain reaction (RT-PCR) or culture in a patient with an acute illness characterized by any of the following:
  - Acute parotitis or other salivary gland swelling, lasting at least two days
  - Aseptic meningitis
  - Encephalitis
  - Hearing loss
  - Orchitis
  - Oophoritis
  - Mastitis
Pancreatitis

**Probable** –
- Acute parotitis or other salivary gland swelling lasting at least two days, or orchitis or oophoritis unexplained by another more likely diagnosis, and a person with a positive test for serum anti-mumps immunoglobulin M (IgM) antibody, OR
- A person with epidemiologic linkage to another probable or confirmed case or linkage to a group/community defined by public health during an outbreak of mumps.

**Suspect** –
- Parotitis, acute salivary gland swelling, orchitis, or oophoritis unexplained by another more likely diagnosis, OR
- A positive lab result with no mumps clinical symptoms (with or without epidemiological-linkage to a confirmed or probable case).

**Epidemiologic Classification for Internationally Imported and US-acquired Cases**

**Internationally imported case:** An internationally imported case is defined as a case in which mumps results from exposure to mumps virus outside the United States (US) as evidenced by at least some of the exposure period (12–25 days before onset of parotitis or other mumps-associated complications) occurring outside the US and the onset of parotitis or other mumps-associated complications within 25 days of entering the US and no known exposure to mumps in the US during that time. All other cases are considered US-acquired cases.

**US-acquired case:** A US-acquired case is defined as a case in which the patient had not been outside the US during the 25 days before onset of parotitis or other mumps-associated complications or was known to have been exposed to mumps within the US.

US-acquired cases are sub-classified into four mutually exclusive groups:

- **Import-linked case:** Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.
- **Imported-virus case:** A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported mumps genotype (i.e., a genotype that is not occurring within the US in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any mumps virus that occurs in an endemic chain of transmission (i.e., lasting ≥12 months). Any genotype that is found repeatedly in US-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.
- **Endemic case:** A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of mumps virus transmission continuous for ≥12 months within the United States.
- **Unknown source case:** A case for which an epidemiological or virological link to importation or to endemic transmission within the US cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to
assure that they do not represent a sustained US-acquired chain of transmission or an endemic chain of transmission within the US.

Note: Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

Reporting:

Report all suspected or confirmed cases of mumps to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation: Complete the CDC Mumps Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

1. **Case management**
   
   1.1. Isolation: Droplet precautions for five days after onset of gland swelling. Exclusion from school, child care, and workplace for five days after onset of gland swelling.
   
   1.2. Prophylaxis: Not applicable.

2. **Contact management**
   
   2.1. Quarantine: Exclusion of exposed susceptible persons from school or daycare from day 12 through day 25 after exposure if other susceptible persons are present.
   
   2.2. Prophylaxis:

   2.2.a Complete immunization if not fully immunized (See table below). In an outbreak setting, excluded students can be readmitted immediately after immunization. Students who are exempted from mumps immunization should be excluded until at least 26 days after the onset of parotitis in the last person with mumps in the affected school.
   
   2.2.b Immune globulin (IG) is not recommended or effective.

3. **Prevention**

   Immunization: Routine immunization with the modified live virus vaccine at 12-15 months of age with a booster before school entry (e.g., 4-6 years of age), in the form of measles/mumps/rubella (MMR) vaccine or measles/mumps/rubella/varicella (MMRV) vaccine. Immunization or documentation of immunity is recommended for health care providers and for school personnel. See table below for vaccination recommendations.
Acceptable Presumptive Immunity to Mumps

1. Laboratory evidence of immunity by serum IgG
2. Documentation of physician-diagnosed mumps
3. Birth before 1957
4. Documentation of adequate vaccination
   - Adequate vaccination is now defined as one dose of a live mumps virus vaccine for preschool-aged children and adults not at high risk.
   - Adequate vaccination is now two doses of a live mumps virus vaccine instead of one dose for
     - School aged children (i.e. K-12)
     - Adults at high risk (i.e. persons who work in health care facilities, international travelers, students at post-high school educational institutions).
   - Adequate vaccination for health care workers
     - Person born during or after 1957 without other evidence of immunity: two doses of a live mumps virus vaccine.
     - Persons born before 1957 without other evidence of immunity: consider recommending one dose of a live mumps virus vaccine.
   - Adequate vaccination for outbreak settings
     - Children aged 1-4 years and adults at low risk: if affected by the outbreak, consider a second dose live mumps virus vaccine.
     - Health care workers born before 1957 without other evidence of immunity: strongly consider recommending two doses of live mumps virus vaccine.

* Minimum interval between doses is 28 days.

Managing Mumps in Child Care Centers

- Exclude symptomatic child from child care for five days from onset of gland swelling.
- Review the immunization status of all children in the facility to assure they have received their first mumps vaccination. Those not adequately immunized should be referred to their clinician.

References


What is mumps?
It is an infection caused by the mumps virus. Sometimes it is called infectious parotitis.

What are the symptoms of mumps?
Symptoms may include fever, headache, muscle aches, tiredness and loss of appetite followed by swelling of salivary glands. The parotid salivary glands (which are located within your cheek, near your jaw line, below your ears) are the most commonly affected. Symptoms of mumps usually appear within 16 to 18 days after exposure but may appear any time within 12 to 25 days after exposure. Some people with mumps have no symptoms at all.

How is mumps spread?
Mumps is spread in droplets from the nose or throat of an infected person, usually when a person coughs or sneezes. Mumps can also spread by direct contact with saliva and discharges from the nose and throat of an infected person.

How long are people contagious?
Mumps is contagious from 1 to 2 days before until 9 days after the onset of swelling.

Who gets mumps?
You can only get mumps once in a lifetime. A person has permanent immunity after having the disease. Usually persons born before 1957 have already had mumps. Persons who receive two doses of the mumps vaccine are much less likely to be infected. The greatest risk of infection occurs among older children, adolescents and adults.

What treatment is available for people with mumps?
There is no specific treatment for mumps. Supportive care should be given as needed.

Do infected people need to be kept home from school, work or daycare?
People should stay home from work, school, daycare or other settings where others could be exposed until 9e days after onset of swelling.

How can I protect myself and my family from getting mumps?
- Mumps-containing vaccine is the best way to prevent mumps. Two doses of MMR (measles-mumps-rubella) combination vaccine or MMRV (measles-mumps-rubella-varicella) combination vaccine are recommended for all children age one year and older. Students in post-high school educational institutions and health care workers should have also received two doses of MMR. Health care workers may instead have testing done to see if they are immune to mumps.
- Wash hands frequently with water and soap and teach children to wash their hands too. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Always cover your nose and mouth when you cough or sneeze, and then wash your hands.
¿Qué son las paperas?
Es una infección causada por el virus de las paperas. A veces se conoce como parotiditis.

¿Cuáles son los síntomas de las paperas?
Algunos de los síntomas son posible fiebre, dolor de cabeza, dolores musculares, cansancio y pérdida de apetito; a esto le sigue la hinchazón de las mejillas debido a la inflamación de las glándulas salivales. Las glándulas salivales de las parótidas que se encuentran cerca de la oreja y parte posterior de la mandíbula son las que normalmente se ven afectadas. Los síntomas suelen aparecer de 16 a 18 días después de haber estado expuesto, pero pueden aparecer en cualquier momento entre 12 y 25 días después del contagio. Algunas personas no tienen ningún síntoma.

¿Cómo se transmiten las paperas?
Las paperas se transmiten cuando una persona estornuda o tose y expulsa al aire pequeñas gotitas que tienen el virus. También se puede transmitir por contacto directo con la saliva y secreciones de la nariz o la garganta de una persona infectada.

¿Por cuánto tiempo puede alguien con paperas contagiar a otros?
Las paperas son contagiosas desde 1 ó 2 días antes de que comience la hinchazón hasta 9 días después de que ésta comenzara.

¿Quién puede contraer las paperas?
Sólo se pueden contraer las paperas una vez en la vida, después de haberlas pasado la persona es inmune. Por lo general, las personas nacidas antes de 1957 ya pasaron las paperas. Las personas que recibieron dos dosis de la vacuna contra las paperas tienen menos posibilidades de contraer la enfermedad. Las personas que tienen mayor riesgo son niños mayores, adolescentes y adultos.

¿Cómo se tratan las paperas?
No hay un tratamiento específico para las paperas. Se puede prestar ayuda para aliviar los síntomas según sea necesario.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Sí. Las personas infectadas deben quedarse en casa y no ir a la escuela, a la guardería, al trabajo o a otros lugares donde puedan exponer a otros al virus hasta que se hayan cumplido 9 días después de que comenzara la hinchazón.

¿Cómo puedo protegerme yo y proteger a mi familia contra las paperas?
- La vacuna contra las paperas es la mejor forma de prevenir la enfermedad. Se recomiendan dos dosis de la triple viral (MMR o MMRV en inglés) contra el sarampión, las paperas y la rubéola para todos los niños de un año de edad y mayores. Los estudiantes universitarios y trabajadores de la salud deben recibir también dos dosis de esta vacuna. Los trabajadores de la salud pueden usar una prueba de sangre para demostrar su inmunidad.
- Lávese las manos con frecuencia con agua y jabón, y enséñele a los niños a hacerlo también. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Siempre cúbrase la nariz y la boca al toser o estornudar y después lávese las manos.
Noncholera Vibrio Infections

Summary

Noncholera Vibrio infections are caused by bacteria in the same family as those that cause cholera. These salt-tolerant gram-negative bacilli are commonly found in warm coastal waters and infection can result from consuming raw or undercooked seafood or exposing a wound to sea water. Noncholera Vibrio species cause three major syndromes: diarrhea, wound infections and septicemia. A mild, self-limited diarrheal illness is the most common syndrome in healthy persons. However, bowel and wound infections in persons who are immunocompromised or have chronic liver disease can result in serious illness and death. Infection can be prevented by cooking seafood adequately, handling raw seafood with care, and avoiding exposure of abrasions to sea water.

Agent

About a dozen Vibrio species can cause human illness, known as vibriosis. The most common species causing human illness in the United States are V. parahaemolyticus, which can cause acute gastroenteritis, V. vulnificus, and V. alginolyticus which can cause primary septicemia and wound infections, particularly in persons with impaired immune function and chronic liver disease. Other pathogenic species include V. cholerae of serogroups other than O1 and O139, V. mimicus, V. fluvialis, V. furnissii, V. hollisae, V. damsel.

Transmission

Reservoir:

Noncholera Vibrio species are commonly found in salt water and naturally inhabit coastal waters of the United States and Canada. Concentrations are usually higher in warm summer months.

Mode of transmission:

V. parahaemolyticus gastroenteritis is usually acquired from raw or undercooked seafood, especially oysters. Wound infections may result from exposure of abrasions or wounds to seawater or seafood.

Period of communicability:

Not normally considered to be communicable from person to person, although theoretically transmission could occur through human fecal contamination of food or water. In this case, the potential period of communicability would be limited to the period of excretion, usually several days.

Clinical Disease

Incubation period:

In general, the median incubation period for gastroenteritis is typically 24 hours with a range of 5 to 92 hours. V. parahaemolyticus – usually 12 to 24 hours, with a range of 4 to 30 hours; V. vulnificus – usually 12 to 72 hours with a range of 12 hours to 7 days.

Illness:

Noncholera Vibrio species are associated with three major syndromes: diarrhea, wound infection, and septicemia. Diarrhea is the most common and is characterized by acute onset of watery stools, often with abdominal cramping, nausea, vomiting and fever. Skin and soft-tissue
infections can develop in contaminated wounds. Persons with impaired immune function or chronic liver disease are susceptible to septicemia from bowel or skin infections, often resulting in shock, bullous or necrotic skin lesions, and death. Wound Infections caused by \textit{V. vulnificus} may start as redness and swelling at the site of the wound that can then progress to affect the whole body. \textit{V. vulnificus} typically causes a severe and life-threatening illness characterized by fever and chills, decreased blood pressure and blood tinged blistering skin lesions.

Most people with mild illness typically recover after about 3 days and suffer no long-term consequences.

\section*{Laboratory Diagnosis}

Noncholera \textit{Vibrio} species can be isolated from stool, blood, or wound exudate cultures. The laboratory should be notified when \textit{Vibrio} infection is suspected, since appropriate media is not used routinely by most clinical laboratories. All noncholera \textit{Vibrio} isolates should be submitted to New Mexico Department of Health Scientific Laboratory Division for confirmation.

\section*{Treatment}

Most episodes of diarrhea caused by noncholera \textit{Vibrio} species are mild and self-limited and do not require treatment other than oral rehydration. Antimicrobial therapy may benefit those with severe diarrhea, wound infection or septicemia.

\section*{Surveillance}

\textbf{Case Definition:}

\textit{Laboratory criteria} – Isolation of noncholera \textit{Vibrio} from a clinical specimen.

\textit{Confirmed} – A case that is laboratory confirmed.

\textit{Probable} – A clinically compatible case that is epidemiologically linked to a confirmed case.

\textbf{Reporting:}

Report all suspected or confirmed cases of noncholera \textit{Vibrio} infection to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Laboratory confirmed cases should also be reported to the New Mexico Environment Department Shellfish Specialist at 505-222-9515, who will coordinate all environmental investigation and traceback activities with the appropriate local, state, tribal and federal regulatory agencies.

\textbf{Case Investigation:}

Complete the CDC Cholera and Other Vibrio Illness Surveillance (COVIS) report form and mail to the Epidemiology and Response Division P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

\section*{Control Measures}

1. Case management

1.1. Isolation:

1.1.a Exclude symptomatic persons from food handling and direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients.
1.1.b For hospitalized patients, standard precautions should be used.
1.1.c For diapered or incontinent children, contact precautions should be used.

1.2. Prophylaxis: Not applicable.

2. Contact management
2.1. Isolation: None required.
2.2. Prophylaxis: Not applicable.

3. Prevention
3.1. Seafood should be cooked adequately, and raw seafood should be handled with care. Children and persons with impaired immune function or chronic liver disease should not eat raw seafood, especially raw oysters or clams.
3.2. Uncooked mollusks and crustaceans should be handled with care, cross contamination of cooked seafood through contact with preparation surfaces or containers should be avoided.
3.3. Abrasions occurring while in contact with saltwater should be rinsed with clean fresh water as soon as possible.
3.4. Immunization: Not applicable.

Management of noncholera *Vibrio* infections in Child Care Centers
1. Outbreaks of noncholera *Vibrio* infections in child care centers have not been documented.

2. Management of isolated cases
2.1. When a case of noncholera *Vibrio* infection occurs among a child care center attendee, that child should be excluded until s/he is asymptomatic, and the stools are formed. Asymptomatic children may return to child care without follow-up stool cultures.
2.2. When a case of noncholera *Vibrio* infection occurs among a child care center staff member, that person should be excluded from their work duties until they are asymptomatic as defined above.
2.3. A case of noncholera *Vibrio* infection in a child care facility should prompt the search for other cases among children and staff members of the facility, as well as household members or other close contacts of the index case. Stool cultures should be obtained on other symptomatic persons.
2.4. The child care center should review its infection control protocols with staff, and emphasize the following:
   - In addition to standard precautions, contact precautions are recommended for diapered or incontinent children. Frequent hand washing routines for staff and children should be implemented.
   - Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water.)
   - Food handling and diaper changing areas should be physically separated and cleaned daily.
• Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning and sanitizing diaper changing surfaces after each use is required.

• Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

• Disposable diapers and soiled disposable wiping cloths should be discarded in a secure, foot-activated, plastic lined container. If available, nonporous gloves should be worn when changing diapers.

References
Norovirus Infections

Summary

Noroviruses are the leading cause of acute gastroenteritis which is sometimes referred to as “stomach flu” or “winter vomiting disease”. Individual norovirus infections are not reportable to the New Mexico Department of Health. However, outbreaks of norovirus are frequently reported to the Epidemiology and Response Division (ERD); therefore, information about norovirus is included in this manual. Suspected outbreaks should be reported to ERD at 505-827-0006. Noroviruses are highly contagious, with as few as 18 viral particles thought to be sufficient to cause infection. These viruses can remain viable and infective on surfaces for up to two weeks. Although the illness is generally short-lived and self-limiting, hospitalizations and deaths have occurred, especially among nursing home residents. Outbreaks of norovirus illness can be due to contaminated food or water, but more commonly the virus is transmitted person to person.

Agent

Noroviruses (genus Norovirus, family Caliciviridae) are a group of related, single-stranded RNA, non-enveloped viruses that cause acute gastroenteritis in humans and were previously described as “Norwalk-like viruses” (NLV.)

Transmission

Reservoir:

Humans are the only known reservoir.

Mode of transmission:

Noroviruses are found in the stool or vomitus of infected people or on contaminated surfaces not properly cleaned and disinfected. People can become infected with the virus through:

- Eating food, drinking liquids or using utensils contaminated with norovirus.
- Touching surfaces or objects contaminated with norovirus, and then touching the face/mouth/mucous membranes.
- Direct contact with the feces or vomitus of a person who is infected and showing signs or symptoms (e.g., while caring for someone who is sick.)
- Inadvertent ingestion of airborne aerosolized virus particles that may occur with patient vomiting.
- Ingesting recreational water that is contaminated and lacks sufficient chlorination.

Persons at increased risk of spreading disease include:

- Food handlers.
- Persons providing direct patient care in hospitals or long-term care facility (LTCF.)
- Residents and visitors of LTCFs.
- Residents of homeless shelters.
- Children and staff in daycare centers and schools.
- Other closed populations (e.g., cruise ship staff and passengers.)
Period of communicability:

Although pre-symptomatic viral shedding may occur, shedding in either stool or vomitus usually begins with onset of symptoms and may continue for two weeks after recovery. Ill persons are most contagious with the greatest amount of viral shedding during the illness and for 48 hours after symptoms end. Long-term shedding is seen but it is unclear how infective the shed virus is above 72 hours after symptoms end.

Clinical manifestations

Incubation period:

Generally, 24 to 48 hours after ingestion of the virus; however, symptoms can appear as early as 12 hours after exposure.

Illness:

Illness is characterized by acute onset of vomiting, watery, non-bloody diarrhea with abdominal cramps, and nausea. Some persons may experience only vomiting or diarrhea. In addition, myalgia, malaise, and headache are commonly reported. Low-grade fever is present in about half of cases. Symptoms usually last 24 to 60 hours. Dehydration is the most common complication of illness and may require intravenous replacement fluids. Studies suggest that up to 30% of infections may be asymptomatic. Mechanisms of immunity to norovirus are unclear. Immunity may be strain-specific and persist for only a few months, but with the genetic variability of noroviruses, individuals may be repeatedly infected throughout their lifetimes.

Laboratory Diagnosis

Diagnosis of norovirus infection relies on the detection of viral RNA in the stools or vomitus of affected persons, by use of reverse transcription-polymerase chain reaction (RT-PCR) assays. In New Mexico, testing is available at the Scientific Laboratory Division (SLD) for outbreak investigation and must be approved by the Epidemiology and Response Division (ERD). Identification of the virus can best be made from stool or vomitus specimens taken within 48 to 72 hours after onset of signs and symptoms, although good results can be obtained by using RT-PCR on samples taken as long as seven days after symptom onset. See Appendix A for more information regarding collection of samples.

SLD does not perform norovirus testing for environmental samples.

Treatment

There are no antiviral medications or vaccines to treat or protect against noroviruses, respectively. Most people recover completely within 1 to 2 days, with no long-term complications of norovirus illness. However, persons who are unable to drink enough liquids to replace those lost with vomiting and/or diarrhea may become dehydrated and require replacement of fluid and correction of electrolyte disturbances through oral and intravenous fluid administration.

Surveillance

The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) have not developed case definitions for a norovirus infection and they are not reportable at the national or New Mexico state level. However, New Mexico Administrative Code requires that suspicion or confirmation of any outbreak, including norovirus, must be reported to ERD at 505-827-0006.

What Constitutes an Outbreak?
Since diarrhea may be fairly common among residents of a long-term care facility (LTCF), determining when there is an outbreak may be subjective. In general, an outbreak of gastroenteritis in a LTCF is defined as the presence of more diarrhea or vomiting than would be anticipated normally in the facility, or in a particular ward/unit, for that time frame of concern.

**Clinical Case Definition:**

The following definition is recommended for a suspected norovirus outbreak in a LTCF:

- Vomiting and/or diarrhea (three or more loose stools per individual in a 24-hour period) in a resident or staff member with sudden onset of symptoms since (specified date) and whose symptoms have no other apparent cause.

An outbreak of norovirus may be categorized as either “suspected” or “confirmed”:

- **Suspected norovirus outbreak** – The signs and symptoms of the illness closely resemble those of norovirus but no laboratory confirmation is available

- **Confirmed norovirus outbreak** – The signs and symptoms of the illness are consistent with norovirus, and laboratory testing yielded positive results for norovirus in specimens collected from at least two ill persons.

**Control Measures**

1. **Case Management**

   Individual norovirus cases are not reportable and, therefore, would not be individually investigated. However, each case within a suspected outbreak will require review or an interview.

   1.1 **Isolation:**

   In general, persons with suspected norovirus infection should be managed with standard precautions with careful attention to hand hygiene practices (see section below). However, contact precautions (as described in [http://www.cdc.gov/ncidod/dhqp/gl_isolation_contact.html](http://www.cdc.gov/ncidod/dhqp/gl_isolation_contact.html)) should be implemented when caring for diapered or incontinent persons, during outbreaks in a facility, and when there is the possibility of splashes that might lead to contamination of clothing.

   1.2 **Prophylaxis:** Not applicable.

2. **Contact Management**

   2.1 **Isolation:**

   Exclude ill staff in specific positions (e.g., food handlers, child care personnel and health care personnel with direct patient care duties) until 48-72 (preferably 72) hours after signs/symptoms resolve.

   Cohort ill patients and/or residents in institutional settings such as long-term care facilities and hospitals until 24-48 (preferably 48) hours after signs and symptoms fully resolve.

   2.2 **Prophylaxis:** Not applicable.

3. **Prevention**

   3.1 **Hand Hygiene:**

   Appropriate hand hygiene has been identified by CDC as the “single most important method to prevent norovirus infection”. Washing hands with running water and plain or
antiseptic soap for at least 20 seconds is the most effective and preferred method. Use of alcohol based gels to cleanse hands has not been shown to be consistently effective.

3.2 Environmental Cleaning:

Disinfecting potentially contaminated surfaces is recommended to prevent exposure and further spread of norovirus. The most effective disinfectant is a chlorine bleach solution made from diluting household bleach in 1:10 dilution by mixing one cup bleach in nine cups water. Health care settings should use products that are EPA-registered and labeled for use in such settings.

Management of Norovirus in a Nursing Home or Institutional-Associated Outbreak:

- Conduct a site visit assessment with appropriate team member(s) to collect further information. Staff should use checklist (Appendix B) to guide their assessment of the facility.

- Conduct surveillance at the facility. Use a line listing to keep track of potential cases. Include:
  
  o Number of ill residents.
  o Number of ill staff (include job function/location and residents with whom they work.)
  o Onset dates (and times if possible) of signs/symptoms.
  o Signs and symptoms.
  o Duration of illness.
  o Physical distribution of illness in the facility.
  o Hospitalizations/deaths.

- Collect samples for laboratory testing as necessary from people who are/have been ill, if this has not already been done. Try to obtain five specimens (or as many possible) from an outbreak in a nursing home or other institution.

- Provide education to facility staff about clinical presentation, disease transmission, and prevention and control measures.

- Coordinate investigation with the New Mexico Environment Department’s Food Program to inspect the food facility to determine whether any food handling staff was ill in the days before the residents’ illness onset dates. This may indicate that a food source may have started the outbreak in the facility. Assure that food handler interviews are conducted in standardized and complete fashion.

- Contact the Division of Health Improvement (DHI) when the investigation is conducted in a facility licensed by DHI to report the gastrointestinal illness outbreak. Explicitly tell them that we are not requesting any onsite investigation on their part unless we have determined it is necessary.

Resident-oriented Prevention and Control Measures:

- Isolate ill residents from others by confining them to their rooms (until three days after their last signs or symptoms resolve). Group ill people together (cohort) if possible.
Discontinue activities where ill and well residents would be together. Group activities should be kept to a minimum or postponed until the outbreak is over.

- Advise closing the facility to new admissions until at least two days (48 hours) after the symptom resolution of the last case.
- If a resident is transferred to the hospital, notify the facility that the resident is coming from a facility at which an outbreak is occurring.

**Staff-oriented Prevention and Control Measures:**

- Healthcare personnel who have acute gastrointestinal illness should be excused from patient care activities while they are ill and for 48-72 hours after their signs and symptoms have resolved. Because the virus may be present in stool for as long as 2-3 weeks after an affected person feels better, strict hand washing needs to be stressed.
- Minimize the flow of staff between sick and well residents. Staff should be assigned to work with either well residents or sick residents, but should not care for both groups. (Staff who go back and forth between ill and well residents play a key role in transmitting the virus from resident to resident.)
- Maintain strict hand hygiene when entering and leaving every resident room. That is, hands should be washed with soap and warm water when entering a room and when leaving the room. Alcohol-based hand sanitizers for general hygiene purposes when hands are not visibly soiled should not be depended on to prevent spread of norovirus.
- Gloves should be worn when caring for ill residents or when touching potentially contaminated surfaces.
- Staffs should wear masks when caring for a resident who is vomiting.
- Housekeeping staff should wear gloves and masks when cleaning contaminated or potentially contaminated surfaces or laundry.
- Contaminated linen and bedding should be carefully placed into laundry bags (to prevent generating aerosols) and washed separately in hot water for a complete wash cycle (ideally as a half load for best dilution.)
- Use an appropriate disinfectant to clean surfaces frequently (see below.)
- Common medical equipment should be adequately disinfected between residents. Consider dedicating pieces of commonly used equipment for use in affected areas.

**Visitor-oriented Prevention and Control Measures:**

- Recommend discontinuing visitation to health care facilities (e.g., nursing homes) until the outbreak is over. If visitation is allowed, visitors should go directly to the person they are visiting and not spend time with anyone else. They should wash their hands upon entering and leaving the room. They should not visit if they are sick.
- Recommend posting signs to remind visitors who are sick to delay their visit until they are well as well as signs that encourage hand washing.

**Management of Norovirus in a Daycare Associated Outbreak:**

- Exclude symptomatic children from day care until cessation of illness. Upon return, hand washing of children must be strictly monitored.
- Exclude symptomatic staff from work until 48-72 hours after cessation of illness.
• Staff hand washing, especially after changing diapers and before food preparation, must be strictly enforced.
• If possible, implement a cohort system (whereby infected children and staff are placed together in a separate area away from other children and staff.)
• Staff should wear gloves and masks when cleaning contaminated or potentially contaminated surfaces or laundry.

Management of Norovirus in a Restaurant or Hotel Associated Outbreak:
• Food handlers and preparers with gastroenteritis caused by norovirus should not work until three days (72 hours) after complete resolution of signs and symptoms.
• In addition, because the virus continues to be present in the stool for as long as 2-3 weeks after the person recovers, strict hand washing after using the bathroom and before handling food items is important in preventing the spread of this virus.
• Food handlers who were recently sick can be given different duties in the restaurant so that they do not handle food (e.g., working the cash register or hostessing.)

Appendices
A. Instructions for Collection of Specimens
B. Checklist for Gastrointestinal Disease Outbreak – Healthcare Facility

References
Centers for Disease Control and Prevention. Updated Norovirus Outbreak Management and Disease Prevention Guidelines. MMWR March 4, 2011/ Vol. 60 (No. RR#3)
https://www.cdc.gov/hai/organisms/norovirus.html


Centers for Disease Control and Prevention. "Norwalk-Like Viruses" Public Health Consequences and Outbreak Management Recommendations and Reports June 01, 2001 / 50(RR09); 1-18
Appendix A
Instructions for Collecting Norovirus Specimens

ERD will approve and coordinate testing for norovirus with Scientific Laboratory Division (SLD) by calling 505-383-9124/9125.

1. Collect a fresh stool specimen (do not use a preservative or any enteric transport media) in a clean, dry container (e.g., urine cup). A minimum volume of one cc is recommended. Collection is best during the first 48 - 72 hours of illness while stools are still liquid or semi-solid (virus is excreted in the greatest amount during this time); however, norovirus can be found by PCR in formed stool up to seven days after symptoms resolve. While norovirus can be detected from vomitus specimens, this specimen type is NOT preferred. If vomitus is the only specimen available for testing, it may be submitted if testing is approved by ERD and coordinated with SLD. Collection of multiple specimens is advised to properly investigate the outbreak. A minimum of two positives is required for entry as an outbreak into CaliciNet.

2. Label each specimen container with the patient's first name, last name, patient ID, date of birth, date and time of collection, and name of the facility. Complete all of the information requested on the submission form clearly and carefully. Check the “Virus Isolation” box and write “Norovirus” in the “Other (specify)” section of the “Agent(s) suspected”. Testing may not be performed if the specimen container is improperly labeled or if the submission form is incomplete.

3. Please indicate the facility name on the submission form and obtain a NORS ID. Numerous norovirus outbreaks may be under investigation within a single geographic area and the facility name/NORS ID is used to track the specimen and to direct appropriate reporting of all testing to CDC via CaliciNet.

4. Specimens for norovirus testing should be refrigerated (not frozen), submitted as soon as possible after collection and placed on ice during transport to SLD. They can be stored in a refrigerator for up to 14 days and be acceptable for testing.

5. If requested, SLD can rule out Salmonella, Shigella, and Shiga-toxin positive E. coli (STEC). A portion of the stool specimen should be placed in Cary Blair enteric transport medium (pink liquid). Specimens collected in Cary Blair transport medium should be maintained at room temperature and received at SLD as soon as possible but no later than 48 hours after collection. Do not ship specimens in Cary Blair on ice.

6. Indicate “Norovirus Testing, PCR” on the outside of the shipping container. Many specimens are received by SLD each day and this will help to rapidly direct the specimens to the appropriate laboratories for testing. If specimens for norovirus testing are collected over a weekend, the specimens should be refrigerated at 35-45 degrees Fahrenheit and processed for shipment to SLD on Monday unless specific arrangements have been pre-coordinated with SLD.
Appendix B
Checklist for Gastrointestinal Disease Outbreak in Health Care Facility

☐ Meet with director and/or infection preventionist:
  ✓ Explain the role of the department of health in helping to control/prevent the outbreak.
  ✓ Explain the disease.
  ✓ Encourage them to educate residents and visitors about how to prevent the spread of infection.
  ✓ Ensure that the facility understands proper sample submission protocol for specimen testing.
  ✓ Distribute educational materials (e.g. CDC setting specific fact sheets and hand washing poster).

☐ Evaluate the facility’s policy for residents who are sick:
Do they isolate ill residents from others by confining them to their rooms?  Yes  No
If ill individuals are not housed in private rooms, does the facility group ill residents together when possible (i.e., cohorting)?  Yes  No

☐ Evaluate the facility’s policy for staff members who are sick:
Are there clear criteria for excluding staff from work?  Yes  No
Are there criteria for returning to work after exclusion?  Yes  No
Are criteria being effectively implemented?  Yes  No

☐ Evaluate visitor policies:
Are visitors restricted during outbreaks?  Yes  No
If visitation is allowed, are visitors directed to go to the person they are visiting and not spend time with anyone else?  Yes  No
Do visitors wash their hands upon entering and leaving the room?  Yes  No
Are visitors reminded not to visit if they are sick?  Yes  No

☐ Evaluate residents’ hand washing:
Are, soap, running water, and paper towels available?  Yes  No
Is hand washing done properly (lather with soap for at least 20 seconds, rinse, turn off water with paper towel after drying hands)?  Yes  No
Are the sinks adequate and appropriate for varying levels of activities
of daily living?  Yes  No
Do staff assist impaired residents wash their hands?  Yes  No
Do residents wash their hands:
  · After using the toilet?  Yes  No
  · Before and after eating snacks and meals?  Yes  No

Evaluate staff hygiene: (Discretely observe hand washing several times during your visit.)
Are, soap, running water, and paper towels available?  Yes  No
Is hand washing done properly (lather with soap for at least 20 seconds), rinse, turn off water with paper towel after drying hands) or use of alcohol-based products if hands not visibly soiled?  Yes  No
Do staff wash their hands:
  · Upon entering and leaving every resident’s room?  Yes  No
  · After each diaper change or after assisting a resident with using the bathroom?  Yes  No
  · Before preparing food or assisting residents with meals?  Yes  No
  · Before administering medicine/treatments?  Yes  No
  · Before eating?  Yes  No
  · After toileting?  Yes  No
Do staff wear gloves when caring for ill residents or when touching potentially contaminated surfaces?  Yes  No
Are gloves discarded and hands washed immediately after completing patient care?  Yes  No

Evaluate environmental controls:
Has administration adjusted staffing to minimizing the flow of staff between sick and well residents?  Yes  No
Have activities where ill and well residents are together been discontinued?  Yes  No
Are group activities kept to a minimum or postponed until the outbreak is over?  Yes  No
Is there a policy for denying new admissions until the incubation period expires after the resolution of the last case?  Yes  No
Is an appropriate disinfectant used? (For example, 1/4 cup bleach per gallon of water prepared daily)?
Are areas contaminated with vomitus and/or diarrhea cleaned immediately
with appropriate disinfectant? 

Is a disinfectant used at least daily to clean surfaces such as handrails, 
doorknobs, physical/occupational therapy equipment? 

Are contaminated linen and bed curtains placed into laundry bags immediately? 
upon removal or use? 

Are contaminated linen, laundry bags, and bed curtains washed separately 
in hot water for a complete wash cycle – ideally as a half load for 
best dilution? 

Do housekeeping staff wear gloves when cleaning contaminated or 
potentially contaminated surfaces or laundry? 

Do housekeeping staff wear masks when cleaning contaminated or 
potentially contaminated surfaces or laundry? (If norovirus suspected) 

☐ Are written hand washing instructions/reminders posted? 

☐ Evaluate the cleanliness of the food preparation area. 
Is there a hand washing sink in the kitchen with soap, running water, 
and paper towels? 

Yes  No
What are noroviruses?
Norovirus is a virus that causes the “stomach flu,” or vomiting and diarrhea, in people.

What are the symptoms of illness caused by noroviruses?
Common symptoms are nausea, vomiting, diarrhea and stomach cramping. Sometimes people have a low-grade fever, chills, headache, muscle aches and a general sense of tiredness. Norovirus illness usually begins 24 - 48 hours after exposure but can appear as early as 12 hours after exposure. The illness is usually brief, with symptoms lasting only 1 or 2 days. Sometimes people are unable to drink enough liquids to replace what they lose from vomiting and diarrhea, and they can become dehydrated and need to see a doctor. This problem usually occurs only among the very young, the elderly, and persons with weakened immune systems.

How is norovirus spread?
Noroviruses are very contagious and spread easily from person to person. The virus is found in the stool (feces) and vomit of infected people. People can become infected in several ways, including:
- eating food or drinking liquids that are “dirtied” or contaminated by infected food handlers
- touching objects contaminated with norovirus and then touching their mouth before hand washing
- having direct contact with an infected person and then touching their mouth before hand washing
- drinking water contaminated by sewage.

Persons working in day-care centers or nursing homes should pay special attention to children or residents who have norovirus illness. This virus can spread quickly in such places.

How long are people contagious?
People infected with norovirus can spread the germ from the moment they begin feeling ill to at least three days after recovery. Some people may be contagious for as long as two weeks after recovery. Persons sick with norovirus should not prepare food while they have symptoms and for three days after they recover. Good hand washing is important. Infected people do not become long-term carriers of norovirus.

Who gets norovirus infection?
Anyone can become infected with these viruses. Because there are many different strains of norovirus, norovirus infection and illness can re-occur throughout a person’s lifetime.

What treatment is available for people with norovirus infection?
Currently, there is no medication or vaccine for norovirus. Norovirus infection cannot be treated with antibiotics. By drinking fluids, such as juice or water, people can reduce their chance of becoming dehydrated.

Sports drinks do not replace the nutrients and minerals lost during this illness.

Do infected people need to be kept home from school, work or daycare?
Since the virus is passed in vomit and stool, children should not go to day care or school while they have diarrhea or vomiting. Once illness ends, children can return to daycare, but hand washing must be strictly monitored. Persons who work in nursing homes, take care of patients, or handle food should stay out of work until at least three days after symptoms end.

Can norovirus infections be prevented?
You can decrease your chance of coming in contact with noroviruses by following these practices:
- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Promptly disinfect contaminated surfaces with household chlorine bleach-based cleaners.
- Wash soiled clothing and linens.
- Avoid food or water from sources that may be contaminated.
¿Qué son los norovirus?
Los norovirus son un grupo de virus que causan la “gripe estomacal”, o vómitos y diarrea.

¿Cuáles son los síntomas de una enfermedad causada por los norovirus?
Los síntomas habituales son náuseas, vómitos y retorcijones en el estómago. Algunas personas pueden tener una fiebre baja, escalofríos, dolor de cabeza, dolores musculares y una sensación general de cansancio. La enfermedad comienza normalmente entre 24 y 48 horas después de haber estado expuesto, pero puede aparecer tan sólo 12 horas después. La enfermedad normalmente es breve, los síntomas sólo duran 1 ó 2 días. A veces si no se toman suficientes líquidos para reponer los que se están perdiendo por vómitos y diarrea, las personas pueden deshidratarse y tendrán que ir al médico. Este problema, por lo general, sólo ocurre en los que son muy jóvenes, las personas mayores y los que tienen su sistema inmune debilitado.

¿Cómo se transmiten los norovirus?
Los norovirus son muy contagiosos y se transmiten fácilmente de persona a persona. El virus se encuentra en las heces y vómitos de las personas infectadas. Se puede transmitir de varias formas, como, por ejemplo:

- Al comer algo o beber líquidos contaminados por las personas infectadas que los manipularon.
- Al tocar objetos contaminados con los norovirus y después, sin lavarse las manos, tocarse la boca.
- Por contacto directo con una persona infectada y después, sin lavarse las manos, tocarse la boca.
- Al beber agua contaminada con desechos residuales o aguas negras.

Las personas que trabajen en centros de cuidado infantil o residencias para ancianos deben prestar especial atención a los niños o residentes que estén enfermos con este virus. Estos virus se pueden transmitir rápidamente en estos lugares.

¿Por cuánto tiempo puede una persona con este virus contagiar a otros?
Las personas infectadas pueden transmitir el germen desde el momento en que empiecen a sentirse enfermas hasta tres días después de haberse recuperado. Algunos pueden ser contagiosos hasta por dos semanas después de haberse recuperado. Las personas enfermas con norovirus no deben preparar alimentos mientras tengan síntomas y deben esperar hasta que hayan pasado 3 días sin síntomas. Es importante lavarse bien las manos. El virus no permanece en las personas y, por eso, no son portadoras del virus.

¿Quién puede contraer una infección por norovirus?
Cualquiera puede contraerla. Puesto que existen muchas cepas (variedades) diferentes del norovirus, las infecciones pueden darse más de una vez en la vida de una persona.

¿Cómo se tratan las infecciones por norovirus?
Hoy día no existe medicación o vacuna para los norovirus. La infección no se puede tratar con antibióticos. Para reducir la posibilidad de quedar deshidratado, es necesario beber muchos líquidos, como agua o jugos. Las bebidas deportivas no reemplazan los nutrientes y minerales que se pierden con esta enfermedad.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Puesto que el virus se encuentra en el vómito y las heces, los niños no deben ir a la escuela o a la guardería mientras tengan diarrea o vómitos. Una vez se recuperen, pueden regresar, pero deben lavarse las manos con mucho cuidado. Las personas que trabajan en residencias de ancianos, cuidan de pacientes o manipulan alimentos no deben ir a trabajar hasta que hayan pasado tres días sin ningún síntoma.

¿Se pueden prevenir estas infecciones?
Para reducir las posibilidades de tener contacto con los norovirus, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Desinfecte las superficies contaminadas con blanqueador de cloro.
- Lave todas las prendas de vestir y ropa de cama que se hayan ensuciado.
- Evite tomar agua o comida que puedan provenir de fuentes contaminadas.
Pertussis

Summary

Pertussis, or whooping cough, is a communicable respiratory disease which can cause severe illness, complications and even death, particularly in infants >6 months of age. Neither infection nor vaccination confer lifelong immunity. Adolescents and adults with mild or atypical disease can transmit pertussis to infants, young children, and other susceptible persons. Pertussis can be prevented and controlled with vaccinations, early recognition of signs and symptoms of illness, prompt diagnosis, treatment of cases, and chemoprophylaxis of select close contacts.

Agent

The bacterium *Bordetella pertussis* is a fastidious Gram-negative bacillus. Several other *Bordetella* species, including *B. parapertussis* (see appendix D below for recommendations), *B. holmesii* and *B. bronchiseptica*, are also occasionally associated with respiratory disease in humans.

Transmission

Reservoir:

Humans.

Mode of transmission:

Pertussis is transmitted person to person by direct contact with respiratory secretions or via respiratory droplets produced from coughing, sneezing, or talking face-to-face with infectious individuals.

Period of communicability:

Pertussis is highly contagious. Persons with pertussis are infectious from the beginning of the catarrhal stage through the third week (21 days) of cough or until five days after the start of appropriate antimicrobial therapy. Factors affecting the length of communicability include age, vaccination status, previous pertussis infection, and the timing of appropriate antimicrobial therapy.

Clinical Disease

Incubation period:

Usually 7-10 days with a range of 5-21 days.

Illness:

Classic pertussis is characterized by spasms of severe coughing (paroxysms) lasting from 6-10 weeks. Pertussis should be suspected in anyone with a paroxysmal cough or a cough that lasts for more than two weeks, regardless of other symptoms. Pertussis classically progresses through three stages though not all cases have a classic presentation:

1. Catarhal (approximately 1-2 weeks): Rhinorrhea, no or low-grade fever, malaise, decreased appetite, and intermittent non-productive cough.
2. Paroxysmal (approximately 1-6 weeks which may extend to 10 weeks): Spasms of cough ending with a gasp, whoop or vomiting (post-tussive emesis). Infants, however, may lack paroxysmal cough and instead may present with poor feeding, gagging, apnea and/or
cyanosis. Adolescents and adults may have prolonged cough with spasms without whoop or post-tussive emesis.

3. Convalescent (approximately 2-3 or more weeks): Gradual resolution of paroxysmal coughing.

Disease is most severe in infants younger than 6 months of life particularly in preterm and unimmunized infants. Infants may not have a typical presentation of illness. Additionally, infants are at the highest risk for complications, including pneumonia, seizures, encephalopathy, and death. Other less serious complications include otitis media, anorexia and dehydration. Infection from \textit{B. parapertussis} resembles whooping cough, although the illness may be milder. Differentiation between pertussis and parapertussis is based on isolation of the bacteria in culture or through polymerase chain reaction (PCR) identification. Co-infections of \textit{B. pertussis} with \textit{B. parapertussis}, \textit{B. holmesii} or \textit{B. bronchiseptica} species have been reported. Acellular pertussis vaccine is only effective in preventing \textit{B. pertussis}.

**Laboratory Diagnosis**

Laboratory methods may differ depending on individual laboratory capabilities. Pertussis testing at New Mexico State Laboratory Division (SLD) is not free. There is a charge for pertussis tests performed at SLD except in cases where the submitter is a NMDOH public health office or when prior arrangements through the Emergency Response Division (ERD) have been made.

**Laboratory testing at SLD:**

- PCR assay performed on a nasopharyngeal (NP) sample obtained via NP swab is the confirmatory diagnostic test that is currently used by SLD in the vast majority of cases. Healthcare providers considering pertussis testing who choose to have their clinical specimens tested at SLD should consult the SLD website at: https://nmhealth.org/about/sld/ for details of proper specimen handling and submission as well as charges that will apply. PCR testing is the most sensitive and specific test available for pertussis diagnosis and is the most common diagnostic method. PCR may detect \textit{Bordetella} DNA up to 3-4 weeks post cough onset and has been known to detect DNA even shortly after starting antibiotics. PCR should only be performed on patients exhibiting a cough illness since false positive results may occur with this method in those without a cough.

- Despite the widespread use and superior sensitivity of PCR, bacterial culture for pertussis is still considered the diagnostic ‘gold standard’ and plays an important role in confirming the diagnosis, particularly during outbreaks. Culture is available through SLD on a limited basis as part of Enhanced Pertussis Surveillance (EPS). Culture specimen collection and submission to SLD should be coordinated with the ERD pertussis epidemiologist and the SLD General Microbiology Supervisor. Culture specimens require special collection kits, culture plates, and a monitored incubator. (Contact ERD at 505-827-0006 for guidance).

- Collection/handling of specimens for SLD: Proper specimen collection and handling is imperative. Only use materials approved by SLD when submitting a specimen for testing. Collection kits and methods for PCR and culture specimens are NOT the same. (For details, see specific specimen collection instructions in Appendix A). Specimens collected during the catarrhal or early paroxysmal stage of illness have the highest yield for PCR and culture. After two weeks of cough, the yield on PCR and culture decreases significantly.

**Laboratory testing at Commercial or Reference Laboratories:**
• PCR or culture may be performed for diagnostic purposes.

• Direct fluorescent antibody (DFA) tests may provide preliminary evidence of infection. However, a high proportion of false-positive and false-negative results occur with DFA, hence it is no longer recommended. Results should be interpreted with caution. PCR or culture confirmation should be performed on patients who are positive by DFA.

• Serology tests (e.g., IgA, IgM and IgG antibody tests) are available in commercial laboratories. These tests, however, have not been validated or standardized. They are not currently being recommended for diagnostic purposes. For updates on validation of commercial assays visit: https://www.cdc.gov/pertussis/clinical/diagnostic-testing/diagnosis-confirmation.html

• Collection/handling of specimens: Check with the laboratory that will be performing testing to assure that specimens are being collected, packaged and shipped in accordance with the laboratory’s specifications.

Treatment

• *Bordetella* genus results from SLD will be available prior to species results. Investigations should begin immediately to identify high-risk susceptible individuals. Treatment and prophylaxis will generally be delayed until species results are available. However, treatment and/or prophylaxis may be indicated prior to speciation in some situations (e.g., young infant, pregnant woman in the 3rd trimester, immunosuppressed person). Those decisions will be made on a case-by-case basis.

• Confirmed, probable and PCR positive suspect cases (refer to case definitions below) of pertussis should be treated with an antimicrobial agent. The treatment and chemoprophylaxis regimens for pertussis are the same (as shown in Appendix B). Treat persons aged greater than one year of age within three weeks of cough onset and infants aged one year or less within six weeks of cough onset. Antimicrobials given during the catarrhal stage may reduce duration and severity of signs and symptoms. Antimicrobials given during the paroxysmal stage may have no effect on the course of illness but are recommended to limit transmission to others. Initiating treatment more than three weeks after onset of cough in those greater than one year old is unlikely to be beneficial but may be considered in situations where there is ongoing contact with an infant or a pregnant woman in the third trimester.

• Treatment of PCR negative suspect cases (refer to case definitions below) of pertussis may be indicated based on clinical and epidemiologic information related to the case. Consult with the Epidemiology and Response Division (505-827-0006) for guidance.

• Infantile hypertrophic pyloric stenosis (IHPS) has been reported in neonates following the use of erythromycin (MMWR 1999; 48:1117-1120). IHPS is hypertrophy of the pyloric muscle that usually results in non-bilious projectile vomiting. Although the risk of IHPS is likely to be low, azithromycin is recommended for infants less than one month old. If azithromycin is not available and erythromycin is used, the health care provider should counsel parents about possible risks of IHPS.

• If a person is allergic to macrolides, has a pre-existing condition that precludes the use of macrolides (see Appendix B), or cannot otherwise tolerate them, trimethoprim-sulfamethoxazole (TMP-SMZ) is an effective alternative. TMP-SMZ is contraindicated for infants less than two months or for pregnant women and nursing mothers. See Appendix C for specific information for treating with azithromycin.
Surveillance

Case Definition:

Clinical Case Definition - In the absence of a more likely diagnosis, a cough illness lasting ≥ 2 weeks with at least one of the following: paroxysms of coughing, inspiratory "whoop," post-tussive vomiting, or apnea, with or without cyanosis (for infants less than 1 year only).

Confirmed -

- An acute cough illness of any duration, with isolation of B. pertussis from a clinical specimen; or
- A case that meets the clinical case definition and is confirmed by PCR; or
- A case that meets the clinical definition and epidemiologically linked with a laboratory-confirmed case.

Probable –

- A case that meets the clinical case definition, is not laboratory-confirmed by culture or PCR (this includes if testing not done or testing negative) and is not epidemiologically linked directly to a laboratory confirmed case.
- An acute cough illness of any duration with at least one clinically-relevant pertussis symptom and confirmation by PCR (Infants < 1 year only)

Suspect -

- A PCR-positive case exhibiting a cough illness who does not meet the clinical case definition for pertussis; or
- Any case with an equivocal PCR, positive smear DFA, or positive serology result exhibiting a cough illness who does not meet the clinical case definition for pertussis; or
- A contact to a confirmed or probable case exhibiting a cough illness but who does not meet the clinical case definition for pertussis.

Reporting:

Report all confirmed, probable and suspect cases of pertussis immediately (24/7/365) to the Epidemiology and Response Division (ERD) at 505-827-0006. Required information includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and healthcare provider. Enter case into New Mexico-Electronic Disease Surveillance System (NM-EDSS) or Fax (505-827-0013) information as soon as it is available.

Case Investigation:

Use the Pertussis Investigation Form to complete the investigation, all fields within this form are considered to be required fields. Enter information collected during investigation into NM-EDSS per established procedures.

Control Measures

1. Case management:

1.1. Isolation: Confirmed, probable, or PCR-positive suspect cases of pertussis should remain in isolation (household contact only) until five days of appropriate antimicrobial therapy have been completed, except when the non-infant case has been coughing for >3 weeks or the infant case has been coughing for >6 weeks.
1.1.a For hospitalized patients, droplet precautions should be used until five days of appropriate antibiotic therapy has been completed.

1.2. Prophylaxis: Not applicable.

1.3. Surveillance activities for pertussis evaluation:

1.3.a Interview case using pertussis case report form and enter information into NM-EDSS.

1.3.b Identify high-risk close contacts and, if asymptomatic, assure prophylaxis as indicated, or refer to healthcare provider (see below).

1.3.c Test, isolate and treat symptomatic contacts presumptively if pertussis is a likely diagnosis and determine if those contacts meet pertussis clinical case definition.

1.3.d Contact the institution (e.g., child care facility, school, or workplace) where case and symptomatic contacts are located.

2. Contact management

2.1. Close contact is defined as follows:

2.1.a Direct contact with respiratory, oral, or nasal secretions (e.g., cough or sneeze in the face, kissing, mouth-to-mouth resuscitation, performing a full examination of the nose and throat)

2.1.b Shared confined space in close proximity for a minimum of ≥ one consecutive hour with a symptomatic case

2.2. High-risk close contacts are:

2.2.a Infants (<1-year-old).

2.2.b Pregnant women in the third trimester of pregnancy

2.2.c Individuals considered to be immunocompromised/immunosuppressed

2.2.d Household members. Household members are defined as persons living in the primary household of a case >50% of the time during the case’s infectious period as measured in days. The days need not be consecutive. A relative or friend who spent <50% of the infectious period (measured in days) with the case would not be considered a household member.

2.3. Isolation: Symptomatic (i.e., those with cough illness) close contacts of confirmed, probable or PCR- positive suspect cases of pertussis should remain in isolation until five days of appropriate antibiotic therapy have been completed or negative PCR results and clinical findings suggest an alternative diagnosis.

2.4. Prophylaxis:

2.4.a. The following close contacts of confirmed, probable, and PCR positive suspect cases of pertussis require chemoprophylaxis, regardless of their vaccination status:

- Infants (<1 year old).
- Pregnant women in the third trimester of pregnancy.
- Household members.
• All those attending or working in a setting (e.g., same infant room, same classroom, same neonatal intensive care unit (NICU) of a case IF there is an infant or a woman in the third trimester of pregnancy in the setting.

• Individuals with pre-existing health conditions or severe immunocompromise that may predispose them to complications associated with pertussis (e.g., pulmonary conditions such as moderate to severe asthma, chronic obstructive pulmonary disease [COPD], lung cancer, cystic fibrosis, significant underlying cardiopulmonary disease, or significant immunocompromise such as organ transplant recipients, people receiving therapies that suppress the immune system).

• Health care providers who provide direct care for infants or pregnant women (e.g., NICU workers, OB/GYNs, pediatricians, family practice physicians, nurse practitioners and physician assistants, nurses, medical assistants, emergency room, EMS personnel)

• Other contacts (or, in rare cases, high-risk contacts of contacts) at the discretion of ERD (e.g., close contacts who are vaccine exemptors, women in the third trimester who are contacts of contacts, infant contacts of contacts, medically fragile contacts of contacts).

2.4.b. Chemoprophylaxis is not recommended for other close contacts who do not meet any of the criteria in 3.3.a above unless special circumstances are identified.

Prophylaxis should be recommended for the contacts listed above who have been exposed within 21 days (one maximum incubation period).

Data supporting the use of antimicrobials to prevent secondary cases are weak. Over-reliance on antimicrobials for pertussis post-exposure prophylaxis may provide a false sense of security. Prophylaxis of contacts does not replace the need for ongoing surveillance. Monitor all settings where confirmed and probable cases have been identified for additional cases for 21 days after last contact with a case.

2.4.c. If a symptomatic contact is identified, that person needs to be evaluated for pertussis. If s/he meets the pertussis case definition, a case report form needs to be completed, the case needs to be entered in NM-EDSS, high-risk and household contacts need to be identified, evaluated, and receive prophylaxis as indicated. Ongoing surveillance of the household for secondary cases is necessary for a minimum of 21 days following the case’s last day of antimicrobials or 21 days after the last day the case was believed to be infectious in situations where antibiotics were not prescribed.

2.4.d. Assess the vaccination status of all contacts. Exposed children less than seven years of age who have received their third dose of DTaP six months or more before exposure to pertussis should be given a 4th dose. Children less than seven years of age who received all four primary doses before their fourth birthday should receive a fifth (booster) dose of DTaP before entering school. Persons 7-9 years of age who have not been fully vaccinated against pertussis should receive Tdap. Those 10 years of age or older who have not received Tdap should get it. There is no need to observe any minimum interval between doses of Td and Tdap. Pregnant women should be vaccinated at each pregnancy and ideally between 27 and 36 weeks gestation. If not administered during pregnancy, Tdap should be administered immediately postpartum. Also, all adults should have documentation.
3. Prevention

3.1. Immunization: There are currently two licensed pertussis vaccines in the US. They are acellular vaccines combined with diphtheria and tetanus toxoids. DTaP is recommended for pediatric use (children under seven years old). Tdap is the adolescent & adult formulation.

3.2. DTaP is the recommended vaccine for use in infants and children up to 7 years of age. The vaccine efficacy for disease prevention is 70-90% after completion of a four-dose series. For more information about vaccines, refer to the NMDOH Immunization Program website at: [http://immunizenm.org](http://immunizenm.org).

Management of Pertussis in Child Care Centers

1. When a case of pertussis is reported in an attendee or staff member at a child care facility, the following recommendations apply:

   1.1. Consult with the ERD at (505) 827-0006 (24/7/365) regarding the case.

   1.2. Notify the child care director that a case has occurred and provide education about disease transmission and prevention.

   1.3. Conduct active surveillance at the facility for one incubation period (21 days).

   1.4. If symptomatic contacts are identified, refer them to a health care provider or, if they have no access to health care services, refer them to their local public health office for consultation and potential evaluation. If a symptomatic contact meets the clinical case definition they need to be entered into NM_EDDS, consider laboratory testing for pertussis, identify their high-risk contacts for prophylaxis, and isolate the case until five days of an appropriate antibiotic have been completed.

   1.5. Any confirmed, probable or PCR-positive suspect cases of pertussis and any symptomatic contacts should be excluded until completion of five days of appropriate antibiotics.

   1.6. Consider excluding the following individuals for 21 days after their last exposure to a case: asymptomatic high-risk contacts who refuse antimicrobials; vaccine exemptors; contacts who are not up to date with pertussis vaccination. These situations will be considered on a case-by-case basis.

2. Consult with ERD if the school requests assistance sending a letter of notification and educational fact sheet to attendees' families and/or school staffs.

3. Assess the vaccination status of all contacts and attendees in the same setting. Exposed children less than seven years of age who have received their third dose of DTaP six months or more before exposure to pertussis should be given a 4th dose. Children less than seven years of age who received all four primary doses before their fourth birthday should receive a fifth (booster) dose of DTaP before entering school. Persons 7-9 years of age who have not been fully vaccinated against pertussis should receive Tdap. Those 10 years of age or older who have not received Tdap should get it. There is no need to observe any minimum interval between doses of Td and Tdap. Pregnant women should be vaccinated at each pregnancy and ideally between 27 and 36 weeks gestation. If not administered during pregnancy, Tdap should be administered immediately postpartum. Also, all adults should have documentation of one dose of Tdap. If adults have not received one dose of Tdap, they should receive it as soon as possible, particularly those who will have contact with infants.
dose of Tdap. If adults have not received one dose of Tdap, they should receive it as soon as possible, particularly those who will have contact with infants and all health care personnel.

4. If an outbreak is identified or suspected, consult with ERD and the child care owner/operator.

5. Focus prophylaxis efforts on high-risk and close contacts.

**Management of Pertussis in a School**

1. When a case of pertussis is reported in a school, regardless of whether the school is private or public, contact the school nurse and provide the following recommendations:
   1.1. Consult with the ERD regarding the case.
   1.2. Inform the principal, teacher(s), and appropriate staff.
   1.3. Elicit the school nurses’ assistance in identifying high-risk close contacts of the case, vaccine exemptors, and those not up to date with pertussis vaccination.
   1.4. Conduct active surveillance at the facility for one incubation period (21 days).
   1.5. If symptomatic contacts are identified, refer them to a health care provider or, if they have no access to health care services, refer them to their local public health office for consultation and possible evaluation. If a symptomatic contact meets the clinical case definition, consider laboratory testing for pertussis, identify their high-risk contacts for prophylaxis, and isolate the case until five days of an appropriate antibiotic have been completed.
   1.6. Any confirmed, probable, or PCR-positive suspect cases of pertussis and any symptomatic contacts should be excluded until completion of five days of appropriate antibiotics.
   1.7. Consider excluding the following individuals for 21 days after their last exposure to a case: asymptomatic high-risk contacts that refuse antimicrobials; vaccine exemptors; or contacts that are not up to date with pertussis vaccination. These situations will be considered on a case-by-case basis.
   1.8. Provide education to staff, students, and parents about the clinical presentation, disease transmission, incubation period, prophylaxis and/or treatment.

2. Consult with ERD if the school requests assistance sending a letter of notification and educational fact sheet to attendees’ families and/or school staffs.

3. If a case attends several classes or group activities at the school, then the school nurse should identify high-risk contacts for prophylaxis in every setting where contact occurred with the case and should report any student with paroxysmal cough of any duration or any student with non-paroxysmal cough illness of ≥7 days duration.

4. Assess the vaccination status of all contacts and students in the same setting. Exposed children less than seven years of age who have received their third dose of DTaP six months or more before exposure to pertussis should be given a 4th dose. Children less than seven years of age who received all four primary doses before their fourth birthday should receive a fifth (booster) dose of DTaP before entering school. Persons 7-9 years of age who have not been fully vaccinated against pertussis should receive Tdap. Those 10 years of age or older who have not received Tdap should get it. There is no need to observe any minimum interval between doses of Td and Tdap. Pregnant women should be vaccinated at each pregnancy and ideally between 27 and 36 weeks gestation. If not administered during pregnancy, Tdap should be administered
immediately postpartum. Also, all adults should have documentation of one dose of Tdap. If adults have not received one dose of Tdap, they should receive it as soon as possible, particularly those who will have contact with infants and health care personnel.

5. If an outbreak is identified or suspected, consult with ERD and school officials.

6. Focus prophylaxis efforts on high-risk and close contacts.

Appendices

- Appendix A. New Mexico Department of Health - Scientific Laboratory Division (SLD), *Bordetella pertussis* (Whooping cough) Specimen Collection Procedure for PCR Testing
- Appendix B. Pertussis Treatment Recommendations
- Appendix C. FDA Azithromycin Warning
- Appendix D. Parapertussis Case Management

References


Centers for Disease Control and Prevention, National Immunization Program. Guidelines for the control of pertussis outbreaks. Available at: https://www.cdc.gov/pertussis/php.html


FDA Drug Safety Communication: Azithromycin (Zithromax or Zmax) and the risk of potentially fatal heart rhythms, March 12, 2013. Available at: https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm343281.htm
Appendix A

New Mexico Department of Health - Scientific Laboratory Division (SLD)

*Bordetella pertussis* (Whooping cough) Specimen Collection Procedure for PCR Testing

Healthcare providers considering pertussis testing through SLD directly should call the infectious disease epidemiology on-call service (available 24/7/365 at 505-827-0006) to expedite testing. Tests approved by an on-call epidemiologist will be processed by SLD at no cost.

If the test ordered has been pre-approved by the ERD on-call service, the submitter must write “pre-approved” in the upper right-hand corner of the SLD General Clinical Request Form.

Kit includes: This instruction sheet, SLD’s General Clinical Request Form, nasopharyngeal (NP) swab in plastic tube for real-time PCR, plastic bag. This kit may be kept at room temperature as there are no temperature requirements for the uninoculated swab.

Wear gloves, a mask and eye protection while collecting specimens to minimize risk of exposure to respiratory secretions.

A. **Obtain a nasopharyngeal specimen as follows:**
   - Immunobilize the patient’s head.
   - Gently insert a thin Rayon/Nylon NP swab into a nostril until the posterior nasopharynx is reached.
   - Leave the swab in place for up to 10 seconds. This procedure may induce coughing and tearing.
   - Remove and repeat procedure on the opposite nostril. It is important to obtain sample from both nostrils, as in some instances one nostril may be negative whereas the other is positive for pertussis.
   - If resistance is encountered during insertion of the swab, remove it and attempt insertion on the opposite nostril.
   - Remove the swab slowly.
     - Immediately replace the swab back into the plastic tube.
     - Label the swab’s plastic tube with the patient’s name and DOB. A preprinted label would be preferable.

B. **Completely fill out SLD’s General Clinical Request Form with:**

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Manual for Investigation and Control of Selected Communicable Diseases
New Mexico Department of Health, Epidemiology and Response Division,
Infectious Disease Epidemiology Bureau

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o Submitter name and address
o Patient name
o Sex
o DOB
oClinician name and phone number
o Date/time collected
o Indicate specimen source (Nasopharyngeal swab)
o Indicate test request (Pertussis, (Bordetella spp.))

C. Place the properly labeled 1) plastic tube with inoculated swab and 2) completed General Clinical Request Form into the plastic bag provided. Send immediately to SLD.
o The inoculated swab can be refrigerated, but if there will be a delay in transport of more than two hours, please place the bag in the freezer.
o When ready to transport, please send to SLD on an ice pack.

D. Rejections
o Samples not received on an ice pack will be rejected.
o Please note that the PCR is able to detect and evaluate specimen quality. SLD will reject specimens where the swab is insufficiently inoculated. Please ensure that your staff follows the instructions described above.
o SLD will only accept swabs that are nasopharyngeal (NP) swabs made of synthetic materials and in dry plastic containers. Swabs made of calcium alginate or cotton are not acceptable. Swabs in paper sleeves will also be rejected. See pictures above for two appropriate types of NP swabs.
o SLD will reject swabs collected as Nasal swabs as opposed to Nasopharyngeal swabs due to the increased chance of obtaining a false negative from a nasal swab.

E. Kits
o The kit can be ordered as usual through SLD’s Specimen Receiving section by faxing Specimen Receiving at 505-383-9062 (ATTN: Kit Prep on the fax sheet).
o Questions on Bordetella testing can be directed to the Molecular Biology Section – 505-383-9130 or 383-9132.
Appendix B

Dosing Guidelines for Treatment and Chemoprophylaxis of Pertussis*

* Taken from Recommended Antimicrobial Agents for Treatment and Postexposure Prophylaxis of Pertussis 2005 CDC Guidelines. MMWR Dec. 9, 2005/Vol. 54/No. RR-14

**Appendix B**

**Table 4. Recommended antimicrobial treatment and postexposure prophylaxis for pertussis, by age group.**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Azithromycin</th>
<th>Erythromycin</th>
<th>Clarithromycin</th>
<th>TMP-SMZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 month</td>
<td>Recommended agent; 10 mg/kg per day in a single dose for 5 days (only limited safety data available.)</td>
<td>Not recommended. Erythromycin is associated with infantile hypertrophic pyloric stenosis. Use if azithromycin is unavailable: 40-50 mg/kg per day in 4 divided doses for 7 days</td>
<td>Not recommended (safety data unavailable)</td>
<td>Contraindicated for infants aged &lt;2 months (risk of koroosis)</td>
</tr>
<tr>
<td>4-5 months</td>
<td>10 mg/kg per day in a single dose for 5 days</td>
<td>40-50 mg/kg per day in 4 divided doses for 7 days</td>
<td>15 mg/kg per day in 2 divided doses for 7 days</td>
<td>Contraindicated at age &lt;2 months. For infants aged ≥2 months, TMP 8 mg/kg per day, SMZ 40 mg/kg per day in 2 divided doses for 14 days</td>
</tr>
<tr>
<td>Infants (aged ≥6 months) and children</td>
<td>10 mg/kg in a single dose on day 1 then 5 mg/kg per day (maximum 500 mg) on days 2-5</td>
<td>40-50 mg/kg per day (maximum 2 g per day) in 4 divided doses for 14 days</td>
<td>15 mg/kg per day in 2 divided doses (maximum 1 g per day) for 7 days</td>
<td>TMP 8 mg/kg per day, SMZ 40 mg/kg per day in 2 divided doses for 14 days</td>
</tr>
<tr>
<td>Adults</td>
<td>500 mg in a single dose on day 1 then 250 mg per day on days 2-5</td>
<td>2 g per day in 4 divided doses for 14 days</td>
<td>1 g per day in 2 divided doses for 7 days</td>
<td>TMP 500 mg per day, SMZ 1,600 mg per day in 2 divided doses for 14 days</td>
</tr>
</tbody>
</table>

*TMP-SMZ should not be administered to pregnant women or nursing mothers.

**Duration of therapy varies by agent.**

- Azithromycin and clarithromycin are better tolerated than erythromycin. Erythromycin frequently causes gastrointestinal disturbances (anorexia, nausea, vomiting, and diarrhea).

- Assess patient medication allergies and potential for drug interactions before selecting agent. Any questions should be discussed with the patient’s health care provider or ERD.

- For pregnant woman, the antimicrobial of choice is erythromycin or azithromycin. Both erythromycin and azithromycin are categorized as pregnancy Class B. There is limited evidence regarding macrolide safety during pregnancy. However, erythromycin and azithromycin have been widely used during pregnancy without evidence of adverse birth outcomes. Clarithromycin should not be used in pregnant women except in clinical circumstances where no alternative therapy is appropriate, and the potential benefit justifies the potential risk to the fetus.

- TMP-SMZ should not be administered to pregnant women or nursing mothers.

- Ampicillin, amoxicillin, and cephalosporins are not suitable for the treatment or chemoprophylaxis of pertussis. In addition, due to their potential harmful side effects in children, tetracyclines, and fluoroquinolones are also not recommended.

- To convert from pounds (lbs) to kilograms (kg) – Divide weight in lbs by 2.2 (e.g. 25 lbs = 25/2.2≈ 11.4 kg).
Appendix C

FDA Azithromycin Warning

Azithromycin remains one of the recommended drugs for treatment and chemoprophylaxis of pertussis. However, newer studies suggest an alternative drug should be used in pertussis cases or contacts that have cardiovascular disease including:

- Patients with known prolongation of the QT interval, a history of torsades de pointes, congenital long QT syndrome, bradyarrhythmias, or uncompensated heart failure.
- Patients on drugs known to prolong the QT interval.
- Patients with ongoing proarrhythmic conditions such as uncorrected hypokalemia or hypomagnesemia, clinically significant bradycardia, and in patients receiving Class IA (quinidine, procainamide) or Class III (dofetilide, amiodarone, sotalol) antiarrhythmic agents.

Elderly patients and patients with cardiac disease may be more susceptible to the effects of arrhythmogenic drugs on the QT interval. Alternatives for treatment/chemoprophylaxis for pertussis include other drugs in the same class as azithromycin (erythromycin or clarithromycin) or trimethoprim-sulfamethoxasole.

Practitioners should continue to be vigilant in diagnosis and treatment of pertussis as outbreaks continue to occur throughout the US. Provisional data from 2012 report more than 41,000 cases of pertussis, the most since 1955. Practitioners should remember that treatment can shorten the duration of illness and lessen its severity when initiated early in the course, which is potentially feasible when given in a household contact of someone with pertussis. As in all drug prescribing, discussion of risk/benefit assessment should occur.

Post-exposure prophylaxis focuses on preventing disease among those at greatest risk for having serious complications from pertussis or spreading the disease to those at greatest risk.

Background

The US Food and Drug Administration (FDA) warned on March 12, 2013 that the antibiotic azithromycin (Zithromax®) can cause abnormal changes in the electrical activity of the heart that may lead to a potentially fatal irregular heart rhythm in some patients.

Patients at particular risk for developing this condition include those with known risk factors such as:

- Existing QT interval prolongation, a history of torsades de pointes, congenital long QT syndrome, bradyarrhythmias, or uncompensated heart failure
- Low blood levels of potassium or magnesium
- A slower than normal heart rate
- Use of certain drugs used to treat abnormal heart rhythms, or arrhythmias
This warning is a result of FDA’s review of a study by medical researchers as well as another study by a manufacturer of the drug that assessed the potential for azithromycin to cause abnormal changes in the electrical activity of the heart.

The azithromycin drug labels have been updated to strengthen the *Warnings and Precautions* section with information related to the risk of QT interval prolongation and torsades de pointes, a specific, rare heart rhythm abnormality. Information has also been added regarding the results of a clinical QT study which showed that azithromycin can prolong the QT interval.

**General Information for Healthcare Professionals**

Health care professionals should consider the risk of torsades de pointes and fatal heart rhythms with azithromycin when considering treatment options for patients who are already at risk for cardiovascular events.

FDA notes that the potential risk of QT prolongation with azithromycin should be placed in appropriate context when choosing an antibacterial drug. Alternative drugs in the macrolide class and non-macrolides, such as the fluoroquinolones, also have the potential for QT prolongation or other significant side effects that should be considered when choosing an antibacterial drug.

**Information for Patients**

- Do not stop taking azithromycin without talking to your health care professional.
- Discuss any questions or concerns about azithromycin or other antibacterial drugs with your health care professional.
- Seek immediate care if you experience an irregular heartbeat, shortness of breath, dizziness, or fainting while taking azithromycin.
- Report any side effects you experience to your health care professional and the [FDA MedWatch program](https://www.fda.gov/medwatch).


Appendix D
Parapertussis and holmesii Case Management

Taken from Minnesota Department of Health’s website:
(http://www.health.state.mn.us/divs/idepc/diseases/pertussis/parapertussis.html)

Parapertussis and holmesii are diseases that affects the lungs. They are similar to pertussis (whooping cough) but less severe.

The symptoms of parapertussis and holmesii can be similar to a cold: sneezing, a runny nose, possibly low-grade fever, and a cough. After a week or two, the cough may become more severe and include:

- A cough that occurs in sudden, uncontrollable bursts.
- High-pitched whooping sounds when breathing in after a coughing episode.
- Vomiting after a coughing spell.

Persons with parapertussis or holmesii do not need to stay home from school, work, or other activities because the illness is relatively mild. However, it is important to still cover your cough and wash your hands to prevent the spread of germs to others.

These diseases can be treated with the same antibiotics as pertussis, but treatment may not cure the symptoms.

Preventive treatment is not generally recommended for contacts of people with parapertussis or holmesii. Preventive treatment may be considered for close contacts who are at a higher risk for more severe disease, including infants less than 6 months of age and immunocompromised people.

- Avoid close contact with others who are coughing or otherwise ill.
- Wash your hands often.
- Cover your cough and sneezes with a tissue, or cough and sneeze into your sleeve.
¿Qué es la tos ferina?
La tos ferina también conocida como tos convulsiva, es una enfermedad respiratoria altamente contagiosa. Es causada por la bacteria Bordetella pertussis.

¿Cuáles son los síntomas de la tos ferina?
Los síntomas normalmente aparecen de 4 a 21 días después de haber estado expuesto a alguien con la enfermedad. Los síntomas ocurren en tres fases.

- **La primera fase** empieza como un resfriado, con nariz mucosa, estornudos, fiebre moderada y tos. La tos dura de una a dos semanas y después empeora.
- **La segunda fase** incluye ataques de tos incontrolables seguidos de un ruido parecido al de un silbido cuando la persona toma aire. Durante estos episodios graves de tos, la persona puede vomitar o puede que su cara o labios se vuelvan azules por falta oxígeno. Es posible que la persona infectada parezca estar bien entre estos episodios de tos. Esta fase dura por muchas semanas.
- **La tercera fase** es la última fase en la que los síntomas empiezan a desaparecer. Esta fase puede durar por muchas semanas también.

¿Cómo se transmite la tos ferina?
La bacteria que causa la tos ferina se encuentra en la nariz y la garganta de las personas infectadas. Estos gérmenes se transmiten a través de las gotitas que expulsa al aire la persona infectada al toser o estornudar. Las personas que están en el inicio de la enfermedad son las más contagiosas.

¿Por cuánto tiempo puede una persona con tos ferina contagiar a otros?
Después de 5 días tomando los antibióticos necesarios, la persona deja de ser contagiosa. Si una persona no toma antibióticos, puede contagiar a otros por 21 días después de que hayan aparecido los ataques de tos.

¿Quién puede contraer tos ferina?
La tos ferina puede ocurrir a cualquier edad, pero la vacunación disminuye el riesgo. Ocurre con más frecuencia en niños muy pequeños que no están vacunados. Los niños mayores y adultos también pueden contraer la tos ferina, pero la enfermedad se da de forma más leve.

¿Cómo se trata la tos ferina?
Los antibióticos pueden reducir el tiempo en que una persona es contagiosa, es decir, en que la enfermedad se puede transmitir a otros. Si se empieza el tratamiento al inicio de la enfermedad, los antibióticos pueden ayudar a que la enfermedad sea menos grave. Sin embargo, incluso con antibióticos, las personas pueden tener tos por muchas semanas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Los antibióticos pueden reducir el tiempo en que la enfermedad es contagiosa. Las personas enfermas deben quedarse en casa hasta que hayan recibido tratamiento con antibióticos por al menos cinco días y se encuentren bien para regresar a la escuela, a la guardería o al trabajo.

¿Cómo puedo protegerme yo y proteger a mi familia contra la tos ferina?
- Reciba el tratamiento preventivo con antibióticos si usted vive en la misma casa o es una persona que tiene contacto cercano con la persona enferma, incluso si está vacunado.
- Reciba el tratamiento preventivo con antibióticos si usted vive en la misma casa o es una persona que tiene contacto cercano con la persona enferma, incluso si está vacunado.
- Tenga al corriente las vacunas de sus niños. La vacuna de la tos ferina se recibe a los 2, 4, 6 y 12 o 18 meses de edad, también se recibe al empezar a la escuela por primera vez. Las personas de 11 a 18 años deben recibir una dosis de refuerzo, lo mejor sería a los 11-12 años de edad.
- Mujeres necesitan una dosis durante cada embarazo entre 26 y 37 semanas de gestación.
- Mujeres embarazadas necesitan una dosis de refuerzo con cada embarazo.
- Los niños no deben acercarse a los enfermos. Tápese la boca antes de toser. Lave las manos después de toser o estornudar. Busque a su médico si tiene síntomas de tos ferina.
What is pertussis?
Pertussis, also known as whooping cough, is a highly contagious respiratory disease. It is caused by the bacterium *Bordetella pertussis*.

What are the symptoms of pertussis infection?
Symptoms usually appear 4 to 21 days after exposure to someone with the illness. The symptoms of pertussis occur in three stages.

- The first stage begins like a cold, with a runny nose, sneezing, mild fever and cough. The cough may be mild at first but soon gets worse.
- The second stage includes uncontrolled coughing or coughing spasms followed by a whooping noise when the person breathes in air. During these severe coughing spells, a person may vomit, or their lips or face may look blue from a lack of oxygen. The infected person may appear well between coughing spells. This stage may last several weeks.
- The third stage is the last stage where the cough slowly begins to disappear. This stage may also last for several weeks.

How is pertussis spread?
The bacterium that causes pertussis is found in the nose and throat of infected people. These bacteria spread through the air in droplets produced when an infected person sneezes and/or coughs. Persons in the early stage of illness are the most contagious.

How long are people contagious?
After five days of the proper antibiotics, people are no longer contagious. If a person does not take antibiotics, s/he is contagious for 21 days after the onset of the coughing spasms.

Who gets pertussis?
Pertussis can occur at any age, but vaccination lowers the risk. It most commonly occurs in very young children who have not been vaccinated. Older children and adults may also get pertussis, but usually a milder form of the illness.

What treatment is available for people with pertussis?
Antibiotics will shorten the length of time the person is contagious and the length of time the illness can be spread. If started in the early stage of the disease, antibiotics may make the illness less severe. However, even with the antibiotics, people may cough for many weeks.

Do infected people need to be kept home from school, work or daycare?
People sick with a cough should be kept home until they have been treated with antibiotics for at least five days and are well enough to return to school, work or daycare.

How can I protect myself and my family from getting pertussis?
- If you are a household member or high-risk close contact of a person with pertussis, take the proper preventive antibiotics.
- Keep up to date on vaccinations. Pertussis-containing vaccine is given at 2, 4, 6, and 12-18 months of age and when a child enters school. Persons 11-18 years of age should receive a single booster dose of pertussis vaccine, preferably at 11-12 years of age. All adults should have a Tdap booster if they haven’t had one.
- Pregnant women need a Tdap at each pregnancy
- Keep infants away from people who are sick. Cover your cough and wash your hands frequently if you are coughing or sneezing. See your healthcare provider right away if you develop symptoms.
Plague

Summary

Plague is a flea-transmitted bacterial infection of rodents caused by *Yersinia pestis*. Fleas incidentally transmit the infection to humans and other susceptible mammalian hosts. Humans may also contract the disease from direct contact with an infected animal. The most common clinical form is acute regional lymphadenitis, called bubonic plague. Less common clinical forms include septicemic, pneumonic, and meningeal plague. Pneumonic plague can be spread from person to person via airborne transmission, potentially leading to epidemics of primary pneumonic plague. Plague is immediately reportable to the New Mexico Department of Health. Plague is treatable with antibiotics, but has a high fatality rate with inadequate or delayed treatment. Plague preventive measures include: droplet isolation of plague patients; prophylactic treatment of pneumonic case contacts and those with exposures to animals with plague; avoiding contact with rodents and their fleas; reducing rodent harborage around the home; using flea control on pets; and, preventing pets from hunting.

Agent

Plague is caused by *Yersinia pestis*, a gram-negative, bi-polar staining, non-motile, non-spore forming coccobacillus.

Transmission

Reservoir:

Wild rodents (especially ground squirrels) are the natural vertebrate reservoir of plague. Lagomorphs (rabbits and hares), wild carnivores, domestic cats, and domestic dogs, may also be a source of infection to humans.

Vector: In New Mexico, the rock squirrel flea, *Oropsylla montana*, is the most important vector of plague for humans though other infected flea species can also transmit plague to humans. Many more flea species are involved in the transmission of sylvatic (wildlife) plague.

Mode of Transmission:

Most humans acquire plague through the bites of infected fleas. Fleas can be carried into the home by pet dogs and cats and may be abundant in woodpiles or burrows where peri-domestic rodents such as rock squirrels (*Spermophilus variegatus*) have succumbed to plague infection. Plague may also be transmitted by: 1) direct contact with tissues and fluids of infected rodents, rabbits or carnivores, including domestic cats and dogs; 2) bites or scratches from an infected domestic cat; 3) inhalation of respiratory droplets from a person or domestic cat with plague pneumonia or pharyngitis; 4) ingestion of raw or undercooked meat from an infected animal; and, 5) (rarely) the mishandling of plague cultures by laboratory workers.

Period of Communicability:

Uncomplicated bubonic plague is not contagious and patients do not place their family, other social contacts or care givers at risk. Household members, however, may be at risk of exposure to the same zoonotic source as the index case. Draining buboes of plague patients should be considered infectious up to 48 hours after start of effective therapy. Pneumonic plague is transmitted by respiratory droplets. Person to person or cat-to-person
transmission can occur from a pneumonic plague source when there is close (less than two meters) direct contact with an infected coughing patient. Patients with pneumonic plague are infectious until 48 hours of appropriate antimicrobial therapy has been given and there is evidence of clinical improvement. However, no person-to-person spread of pneumonic plague has occurred in the United States since 1924, although in 2014 there was one documented case of a possible human-to-human transmission in Colorado where the case also had direct contact with an infected dog. Five cases of primary pneumonic plague acquired from domestic cats were reported in the interval 1977 – 1998.

Clinical Disease

Incubation period:

For bubonic plague, the incubation period is 2-8 days. For primary pneumonic plague, the incubation period is 1-6 days.

Illness:

The common signs and symptoms of plague include fever, severe malaise, weakness, headache, chills, myalgia and sometimes gastrointestinal symptoms. Specific forms of plague include:

1. Bubonic: This is the most common form of plague. Patients experience pain in the affected regional lymph node (called a bubo) that drains the site of the flea bite. The infected node may not be palpably enlarged during early stages. The three most common bubo locations, in descending order, are femoral/inguinal, axillary, and cervical. A femoral or inguinal bubo is likely to appear in those persons who are bitten on the leg by an infectious flea, whereas those who contract plague as a result of handling an infected animal are likely to develop an axillary bubo. Progression of signs and symptoms is usually rapid with the affected buboes becoming excruciatingly tender and painful. In some instances, usually with delayed treatment, the infection causes destruction of the lymph node with subsequent bacteremia. Untreated bubonic plague has a case fatality rate of 50-60%.

2. Septicemic: Septicemic plague is a progressive, overwhelming bloodstream infection that can result from untreated bubonic plague (i.e., secondary septicemic plague), but may also occur without prior lymphadenopathy (i.e., primary septicemic plague). Primary septicemic plague is especially dangerous due to difficulty of rapid diagnosis in the absence of a bubo. Gastrointestinal signs and symptoms are prominent in primary septicemic plague, including nausea, vomiting, abdominal pain, and diarrhea. Dissemination of Y. pestis to other organ systems via the bloodstream can result in secondary pneumonic plague, meningitis, endophthalmitis, multiple lymphadenitis, and hepatic or splenic abscesses. Plague endotoxin can produce septic shock, disseminated intravascular coagulation (DIC), multiple organ failure, coma, and death.

3. Pneumonic: Hematogenous spread of plague bacilli to the lungs can result in secondary pneumonic plague. Entry of the plague bacillus via the respiratory tract may result in primary plague pneumonia, the most fulminating and fatal form of plague. Pneumonic plague patients are likely to have cough, chest pain, dyspnea and hemoptysis. Segmental pneumonitis may progress to bronchopneumonia and then to bilateral lung involvement. Pulmonary complications may include localized areas of necrosis and cavitation, pleurisy with effusion, and acute respiratory distress syndrome. Untreated pneumonic plague is almost always fatal.

4. Other syndromes:
Asymptomatic or subclinical infections with plague are rare to nonexistent.

Plague meningitis is a rare complication and typically occurs more than one week following inadequately treated bubonic plague. This form of plague is characterized by fever, headache, stiff neck, delirium, confusion, obtundation or coma. It is more common in patients with axillary buboes. Meningeal plague may be a primary manifestation (i.e., without prior lymphadenitis).

Plague pharyngitis may resemble tonsillitis. Anterior cervical lymph nodes are usually inflamed. Contamination of the oropharynx with \textit{Y. pestis}-infected material is presumed to follow inhalation or ingestion of plague bacilli.

Plague should be considered in any patient who presents with fever and acute lymphadenitis and resides in a known plague area. Plague has been found in animals or fleas throughout New Mexico. The majority of human cases in New Mexico have occurred in seven northern counties: Bernalillo, McKinley, Rio Arriba, San Miguel, Sandoval, Santa Fe, and Taos. Other factors that increase the likelihood of plague include: illness onset in May-October; residence in a rural or semi-rural area; household cats that hunt; presence of insect bites; handling sick or dead animals; fleas on pets; and, a history of hunting or trapping.

Laboratory Diagnosis

Confirmatory

- Isolation of \textit{Y. pestis} from a clinical specimen, OR
- Fourfold or greater change in serum antibody titer to \textit{Y. pestis} F1 antigen

Diagnosis of plague usually is confirmed by culture of \textit{Y. pestis} from blood, bubo aspirate, or other clinical specimens. Samples should be submitted to the New Mexico Department of Health Scientific Laboratory Division (SLD) for confirmation. At SLD, contact the General Microbiology section (505-383-9128 or 505-383-9127) for questions about specimen submission.

Presumptive

- Elevated serum antibody titer(s) to \textit{Yersinia pestis} fraction 1 (F1) antigen (without documented fourfold or greater change) in a patient with no history of plague vaccination, OR
- Detection of F1 antigen in a clinical specimen by fluorescent assay

Treatment

Prompt diagnosis and treatment are critical for reducing the high fatality rate of plague. When human plague is suspected on clinical and epidemiological grounds, appropriate specimens for diagnosis should be obtained immediately, and the patient should be started on specific antimicrobial therapy pending laboratory confirmation.

- Treatment of disease: It is important for physicians with suspected cases to discuss the case with an infectious disease specialist to assist in diagnosis and treatment decisions. Streptomycin is effective against \textit{Y. pestis} and is considered the drug of choice for treatment of plague, particularly the pneumonic form. However, streptomycin has limited availability and can be ototoxic and/or nephrotoxic. Gentamicin in standard doses for age given intramuscularly or intravenously appears to be an equally effective alternative to streptomycin. Chloramphenicol penetrates...
tissues well and may be an option for treating plague meningitis, endophthalmitis, myocarditis, and pleuritis, though in rare instances it can cause aplastic anemia. Fluoroquinolones also have been found to be effective in treating plague in animal and in vitro studies but currently only levofloxacin is approved by the US Food and Drug Administration for both treatment of plague and prophylaxis after exposure to plague. Tetracyclines are effective for uncomplicated plague. Tetracycline and doxycycline are usually given for prophylactic treatment of plague contacts. Tetracycline or doxycycline should not be given to pregnant women or children < 8 years old unless benefits outweigh risks of dental staining. For children, trimethoprim-sulfamethoxazole may also be an option for prophylaxis. Trimethoprim-sulfamethoxazole should not be considered a first-line treatment option when treating bubonic plague and should not be used as monotherapy to treat pneumonic or septicemic plague, because some studies have shown higher treatment failure rates and delayed treatment responses.

Prophylactic Therapy: Persons in close contact (i.e., less than two meters) with a human or feline case of pneumonic plague or with draining buboes (humans or animals), or persons likely to have been exposed to Y. pestis through flea bites or direct contact with a plague-infected animal, or persons exposed to plague in a laboratory accident, should receive antibiotic preventive therapy if exposure occurred within the previous week. Contacts should be instructed to measure their temperature twice a day for seven days and see a physician immediately if fever greater than 100°F develops. Contact the ERD at 505-827-0006 regarding specific recommendations for plague prophylaxis.

Supportive Therapy: Most patients are febrile with constitutional signs and symptoms, including nausea and vomiting. Hypotension and dehydration are common. Patients should be hospitalized and aggressively monitored, and clinicians should be prepared for possible septic shock, multiple organ failure, acute respiratory distress syndrome, and disseminated intravascular coagulopathy. Buboes occasionally require incision and draining.

Surveillance

Case Definition:

Confirmed – a clinically compatible case with confirmatory laboratory results.

Probable – a clinically compatible case with presumptive laboratory results.

Suspected – a clinically compatible case without presumptive or confirmatory laboratory results.

Reporting:

Report all suspected, probable or confirmed cases of plague immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. The Epidemiology and Response Division will complete a plague case report form.

Case Investigation:

Complete the CDC Plague Surveillance Report form and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-
827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

Control Measures

1. Case management
   1.1. Isolation: For bubonic, septicemic, and pneumonic plague, droplet isolation is required until 48 hours of appropriate antibiotic therapy have been given and there has been a favorable clinical response (i.e., defervescence).
   1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. Isolation: None required.
   2.2. Prophylaxis (also see treatment section):
      2.2.a Asymptomatic persons having household or other close contact (i.e., less than two meters) with persons or animals with untreated pneumonic plague should receive post-exposure antibiotic prophylaxis for seven days. Additionally, contacts should measure their temperature twice a day for seven days and see a physician immediately if fever greater than 100°F develops.
      2.2.b Close contacts of persons or animals with draining buboes may also need post-exposure prophylaxis. Consult with ERD for further recommendations.
      2.2.c Close contacts of persons or animals with nondraining buboes should measure their temperature twice a day for seven days and see a physician immediately if fever greater than 100°F develops.

3. Prevention
   3.1. Immunization: Manufacture of US licensed inactivated whole cell Y. pestis vaccine was discontinued in 1999 and is no longer available.
   3.2. Surveillance of rodent and flea populations: The Department of Health Zoonoses Team conducts a field investigation of every confirmed case of plague in New Mexico to assess the likely source of infection and potential risk to others in that environment. Report rodent die-offs (e.g., a previously active prairie dog colony that has suddenly disappeared) to ERD. Within Bernalillo County, report rodent die-offs to the Albuquerque Environmental Health Department’s Urban Biology Division (505-452-5300).
   3.3. Control of rodents and fleas: Interdictive flea control may be carried out on a limited basis where the risk of flea transmission to humans is high, such as during a plague epizootic in a housing area. Rodent control on a limited basis should only be done after effective flea control is accomplished. Sylvatic plague defies most control measures because the wild rodent reservoirs are so widespread and diverse.
   3.4. Public education: Educate the public about risk factors, preventive measures, and signs and symptoms of plague.
      3.4.a Control fleas on pets and prevent pets from roaming.
      3.4.b Avoid contact with dead and sick animals or rodent nests or burrows.
      3.4.c Reduce rodent harborage around the home, such as junk piles and abandoned vehicles.
3.4.d Stack woodpiles at least 24 inches above the ground and 100 feet from the house.
3.4.e Rodent-proof houses and outbuildings.
3.4.f Wear rubber gloves when handling wild game.
3.4.g Keep cats indoors or hunting cats outdoors. Immediately take to veterinarian any pet (especially a cat but also a dog) that hunts and has signs of fever and lethargy.

References


What is plague?
Plague is a disease caused by the bacterium *Yersinia pestis*. These bacteria live in certain rodents (e.g., squirrels, prairie dogs or mice) and other small mammals (e.g., rabbits or hares). Fleas can become infected from feeding on these animals. Plague is a rare disease in humans.

What are the symptoms of plague?
Symptoms appear from 1 to 8 days after exposure. Symptoms may include fever, chills, nausea, headache and body aches. There are three main forms of plague, and depending on the form, an infected person may have other symptoms.

- **In bubonic plague**, persons develop a swollen, painful lymph node (called a “bubo”) near where the infected flea bit them.
- **In septicemic plague** (bloodstream infection), persons develop stomach pain, shock and bleeding into skin and other organs.
- **In pneumonic plague** (lung infection), persons develop a cough with bloody or watery sputum and have a hard time breathing.

How is plague spread?
Plague bacteria live in rodents and other small mammals. When fleas feed on infected animals, the fleas also get infected. The disease may then be spread to people and pets if they are bitten by the infected fleas. Persons may also get the disease through close contact with infected animals (e.g., through an animal bite or scratch or through handling animal tissues). If the disease gets into the lungs, it may be spread from person to person by droplets released when the infected person coughs.

How long are people contagious?
Persons with plague that results in pneumonia should be isolated in the hospital until 48 hours after antibiotics have been started.

Who gets plague?
Anyone who lives in an area where rodents and fleas are found can get plague. This includes people from all parts of New Mexico.

What treatment is available for people with plague?
Specific antibiotics are prescribed by a doctor to treat plague. If plague patients do not receive early treatment, the disease can progress rapidly to death. About 14% of all human plague cases in the United States are fatal.

Do infected people need to be kept home from school, work or daycare?
People who have plague will most probably be in the hospital. Persons infected with plague may spread the germ until 48 hours after proper antibiotics are started.

How can I protect myself and my family from getting plague?
- Talk with your doctor if you have been in close contact with a person or pet who has plague. Sometimes close contacts should receive prevention antibiotics and/or watched for any signs of illness.
- Avoid contact with rodents and fleas, avoid handling sick or dead stray animals, and stay away from rodent infested places.
- Regularly treat outdoor pets with flea products.
- Control for rodents by reducing places close to your home where they might like to nest and place tight lids on garbage and pet food.

What about my pet?
Immediately take your pet to the vet if it develops symptoms of fever, tiredness and/or loss of appetite after contact with rodents or after hunting.
¿Qué es la peste?
La peste es una enfermedad causada por la bacteria *Yersinia pestis*. Estas bacterias viven en determinados roedores (como ardillas, perros de la pradera o ratones) y otros pequeños mamíferos (como conejos o liebres). Las pulgas se pueden infectar al alimentarse de estos animales. La peste es una enfermedad rara en humanos.

¿Cuáles son los síntomas de la peste?
Los síntomas aparecen de 1 a 8 días después de haber estado expuesto. Los síntomas incluyen fiebre, escalofríos, náuseas, dolor de cabeza y debilidad. Hay tres formas principales de peste y, dependiendo de ésta, la persona infectada puede tener otros síntomas.

- En la **peste bubónica**, se produce la inflamación dolorosa de los ganglios linfáticos (llamados bubones) cerca del área dónde les picó la pulga.
- En la **peste septicémica** (infección en la sangre), se produce dolor de estómago, shock, hemorragia en la piel y otros órganos.
- En la **peste neumónica** (infección en los pulmones), se desarrolla tos con sangre o esputo y dificultad para respirar.

¿Cómo se transmite la peste?
La bacteria de la peste vive en roedores y otros mamíferos pequeños. Las pulgas se infectan cuando se alimentan de animales infectados. Si estas pulgas infectadas les pican a las personas o mascotas, entonces les transmiten la enfermedad. También se puede contraer por contacto cercano con animales infectados (por ejemplo, si el animal le muerde o le hace una herida, o si manipula la carne del animal). Si la enfermedad entra a los pulmones, se puede transmitir de persona a persona por contacto con las gotitas que la persona enferma expulsa al toser.

¿Por cuánto tiempo puede alguien con la peste contagiar a otros?
Las personas que desarrollan el tipo de peste que afecta a los pulmones y resulta en neumonía deben permanecer aisladas en un hospital hasta haber completado 48 horas (2 días) de tratamiento con antibióticos.

¿Quién puede contraer la peste?
Cualquiera que vive en un área donde hay roedores y pulgas puede contraer la peste. Esto incluye personas de todas partes de Nuevo México.

¿Cómo se trata la peste?
Se recetan antibióticos específicos para tratar la peste. Si los pacientes con la peste no reciben tratamiento temprano, la enfermedad puede progresar rápidamente y ser mortal. Aproximadamente un 14% de todos los casos de peste en personas resultan en muerte en los Estados Unidos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Es muy probable que las personas con peste estén en un hospital. Las personas infectadas deben completar 48 horas (2 días) de tratamiento con antibióticos para que ya no puedan transmitir el germen.

¿Cómo puedo protegerme yo y proteger a mi familia contra la peste?
- Hable con su médico si ha tenido contacto cercano con una persona o una mascota que tenga la peste. A veces si tuvo contacto cercano, debe recibir antibióticos preventivos o ser monitoreado por si desarrollara la enfermedad.
- Evite el contacto con roedores y pulgas, no manipule animales que estén enfermos o muertos y no sepa de dónde vienen y no se acerque a lugares que estén infestados por roedores.
- Trate a sus mascotas con productos contra las pulgas.
- Evite que haya roedores, para ello reduzca los posibles lugares cerca de su casa en los que puedan hacer nidos, mantenga la basura y la comida de sus mascotas en recipientes bien cerrados con tapas.

¿Y mi mascota?
Lleve a su mascota al veterinario de inmediato si, después de haber estado en contacto con ratones o después de cazar, desarrolla síntomas como fiebre, cansancio y pérdida de apetito.
Pseudomonas aeruginosa

Summary

*Pseudomonas* are gram-negative organisms with the ability to easily adapt to environmental challenges. *Pseudomonas aeruginosa* (*P. aeruginosa*) is the most relevant *Pseudomonas* species causing disease in humans.

*Pseudomonas aeruginosa* is considered an important opportunistic gram-negative bacterium, known to cause severe infections, particularly among immunocompromised hosts. *P. aeruginosa* is recognized as a concerning pathogen in acute care facilities, particularly in Intensive Care Units (ICUs) and long-term care facilities. Risks factors for *P. aeruginosa* infections include age, heart disease, diabetes mellitus, chronic pulmonary disease, antibiotic use and invasive procedures. The most common *P. aeruginosa*-associated infections include pneumonia, bacteremia, urinary tract infections, meningitis, skin and soft tissue infections.

*Pseudomonas* is intrinsically resistant to multiple antibiotics. Due to its innate resistance and keen capability to acquire additional resistance, therapeutic options are limited. Antibiotics from the Carbapenem group are considered an optimal resource for the treatment of serious infections. They are often considered the last option to treat an infection with *Pseudomonas*. The emergence and rapid spread of Carbapenem resistance is highly concerning and will be the focus of attention in this chapter.

Agent

*Pseudomonas* are aerobic organisms, ubiquitous in soil, plants, water and animals. The predilection of this organism for water makes it an ideal pathogen in the setting of moist environments, such as in patients on mechanical ventilation or exposed to contaminated water.

*P. aeruginosa* virulence factors include the ability of forming biofilm and the ability to produce toxins that can destroy tissue. Given its affinity for moist environments and biofilm formation, *P. aeruginosa* is one of the most common pathogens associated with ventilator associated pneumonias and catheter associated urinary tract infections. The rates of *P. aeruginosa* infections are particularly high in ICUs and Nursing Homes.

The main concern with this organism is that *P. aeruginosa* has the intrinsic capability of resisting the action of most clinically available antibiotics. Mechanisms through which it resists antibiotics include, alluding the action of antibiotics by eliminating the channels known as porins, through which antibiotics enter the cell or, by altogether, actively expelling the antibiotic outside the cell utilizing an efflux pump.

*P. aeruginosa* also has encoded in its chromosome the capability of producing an enzyme that renders the organism resistant to the action of antibiotics from the beta-lactam group. The AmpC enzyme, hydrolyzes most penicillins and cephalosporins with the exception of cefepime. Other than the AmpC enzyme, most other enzymes that hydrolyze antibiotics can be acquired by *P. aeruginosa* via DNA molecules known as plasmids, which are commonly transferred among bacteria. Many of the enzymes that render *P. aeruginosa* resistant to beta-lactams and monobactams (*aztreonam*), known as extended spectrum beta-lactamases (ESBLs) are acquired through plasmids. Plasmid exchange is highly frequent in nature.

Carbapenems, kill *P. aeruginosa* in a similar way that beta-lactams do but can penetrate through the cell much better than beta-lactams. They also tend to be more stable against many beta-lactamases than antibiotics from the beta-lactam group. Antibiotics in the carbapenem class include: imipenem, meropenem, ertapenem and doripenem. Of these, only imipenem,
meropenem and doripenem are active against \textit{Pseudomonas aeruginosa}. Ertapenem has no activity against this organism.

Until recently, most of the carbapenem resistance observed in \textit{P. aeruginosa} revolved around the loss of a specific channel [OprD] which made the organism impermeable to the drug. This mechanism confers resistance to imipenem and to a lesser to other carbapenems. In recent years the acquisition of novel extended spectrum beta-lactamases, particularly metallo-beta-lactamases have become a worldwide concern, as they effectively eliminate the use of carbapenems to treat \textit{P. aeruginosa} infections, making infections close to untreatable.

**Transmission**

Reservoir: \textit{Pseudomonas} is not a common bacterium that inhabits the healthy human microbiome. Changes in the microbiome are typically necessary in order to develop long term colonization with this organism. The use of antimicrobial agents, gastrointestinal disease and diet may be predisposing factors. Individuals with chronic pulmonary diseases such as cystic fibrosis and bronchiecstasis are also highly predisposed to colonization of their respiratory tract with \textit{P. aeruginosa}.

\textit{P. aeruginosa} can be found on inert surfaces in the healthcare setting, including stethoscopes, chairs, bedrails, door handles, elevators, respiratory therapy equipment, bronchoscopes, endoscopes, cleaning equipment such as mops and buckets and almost every piece of equipment used at bedside. It is also particularly commonly found in bathtubs, hot tubs, shower heads, water baths and sinks.

Less virulent community acquired infections caused by \textit{P. aeruginosa} include hot tub associated folliculitis, otitis externa (swimmer's ear) and nail infections. Pneumonias associated to contaminated auto air conditioners and home humidifiers have also been reported. Long term colonization with this organism may occur but its true duration and prevalence is not known.

Prevalence and duration of colonization appears to be lesser than for similar organisms from the \textit{Enterobacteriaceae} or \textit{Acinetobacter} groups.

Mode of Transmission:

- **Exogenous**
  - Through the hands of healthcare workers.
  - Through contaminated environmental surfaces.

- **Endogenous**
  - Transformation of an initially sensitive colonizing organisms that subsequently becomes resistant.

Period of communicability: Currently unknown.

**Clinical Disease**

Incubation Period: There is no defined incubation illness period. Host specific factors and co-morbidities are the main predisposing factors for the development of infection.

Illness: The organism is known to cause the following diseases:

- Bacteremia of unknown origin.
- Infective Endocarditis.
- Pneumonia
Healthcare associated.
Nosocomial.
Ventilator associated.
Community acquired.
Urinary tract Infections.
Osteomyelitis.
Skin and Soft Tissue Infections.
Ecthyma gangrenosum.
Body piercing.
Hot tub folliculitis.
Paronychia.
Ear Infections.
Simple otitis externa (swimmers ear).
Malignant otitis externa.
Eye Infections.
Endophthalmitis.
Keratitis.

**Laboratory Diagnosis**

Diagnosis is made based on clinical presentation and culturing of the organism.

**Treatment**

*P. aeruginosa* that is not expressing multi-drug resistance may be treated with ceftazidime, cefepime, piperacillin-tazobactam, ticarcillin-clavulanic acid, ciprofloxacin or high dose levofloxacin. Aminoglycosides such as gentamicin, tobramycin and amikacin, can be active against *Pseudomonas* but their toxicity, combined with lack of data demonstrating favorable outcomes, makes this antibiotic class less desirable as single therapy. The use of continuous or extended intravenous infusion rate of beta-lactams is preferred to interval dosing, as this maintains levels above the minimum inhibitory concentration at a constant rate.

Due to increased rates of resistance, carbapenems are often used to treat infections with *P. aeruginosa*. In the USA, carbapenems are only available for intravenous use. Once an organism is considered resistant to a carbapenem, it is considered resistant to all antibiotics in this category.

Treatment options are highly decreased if the organism is multi-drug resistant, carbapenem resistant organism. Rarely carbapenem-resistant *P. aeruginosa* (CRPA) will exhibit in vitro susceptibility to third and fourth generation cephalosporins such as ceftazidime and cefepime. These may only have utility for low inoculum infections, excluding life or limb threatening infections. Combination of ceftazidime/avibactam may sometimes be effective in the treatment of some strains of CRPA. At the time that this manuscript was written, the only other treatment considered as acceptable is colistin. Colistin toxicity is high and must be used with caution and only when needed.
Surveillance

The prevalence of CRPA and carbapenemase-producing *P. aeruginosa* (CPPA) in the United States is not fully known but given its worldwide prevalence, it is assumed the prevalence is increasing at a rapid pace.

Routine screening for CRPA and CPPA is not currently recommended.

Screening for colonization may be considered for high risk populations and settings such as ICUs and nursing homes and/or, during outbreaks. Pros and cons must be considered by each organization. While rectal swabs are routinely used for surveillance purposes for other carbapenem resistant organisms, the utility of this method as a screening tool for CRPA and CPPA is debatable, as the organism primarily colonizes the respiratory tract.

Microbiologists and infection prevention professionals at each institution should determine the risk that CPPA carries at their institution and consider applicable options for surveillance and detection.

*Laboratory criteria –*

*Pseudomonas* is easily grown in clinical laboratories. Most automated laboratory analyzers can accurately identify the organism. Clinical laboratories routinely use phenotypic patterns to advice clinicians of susceptibilities. Clinicians may infer resistance mechanisms based on susceptibility patterns, but this may be inaccurate as this organism may have multiple mechanisms contributing to resistance at once yet, not necessarily express it in a way that may detectable based on phenotypes.

As previously mentioned, Beta-lactamases are abundant among *P. aeruginosa*. Beta-lactamases are classified into four mayor groups:

1. Extended Spectrum Beta-lactamases (ESBLs) that are inhibited by clavulanic acid.
3. Cephalosporinases (AmpC).
4. Oxacillinases (OXA).

Much of the carbapenem resistance among *P. aeruginosa* is due to the production of metallo-beta-lactamases (MBLs). Currently, 10 subclasses of MBL enzymes are known. Of these, IMP and VIM are spread worldwide, including the US.

Most clinical laboratories do not have the capability of determining whether a carbapenem resistant organism is a carbapenemase producing organism or not. The number of laboratories acquiring technology that affords the capability of identifying these enzymes is increasing but at the present time, the use of advanced technologies that, not only can detect the presence of a carbapenemase but also identify enzyme class, is limited.

Detection of carbapenemase can be achieved by using the Modified Hodge Test (Attachment A). This test may be particularly useful for detection of KPCs and OXA48 but not NDMs. This is a basic technique available to many commercial and clinical laboratories. However, the results are subject to the interpretation of the user, typically matching levels of experience.

The presence or absence of Carbapenemase is suspected or confirmed as follows:

*Confirmed* – Identification of the enzyme by an experienced laboratory including CDC, CDC Regional Laboratories or State Laboratories.
Probable – A positive Modified Hodge Test in the hands of an experienced operator.

Suspect – Resistance to one carbapenem is used as predictor for resistance to all carbapenems. *P. aeruginosa* is considered carbapenem resistant if the MIC is $\geq 4$ µg/ml for imipenem, meropenem or doripenem. *P. aeruginosa* should be always be assumed to be resistant to ertapenem.

Reporting:

Report all suspected or confirmed cases of Carbapenem resistant *P. aeruginosa* within 24 hours to the Epidemiology and Response Division (ERD) at 505-827-0006. Clinical isolates are to be forwarded to the State Public Health Laboratory (SLD) for further characterization. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. Information should also be entered into NM-EDSS per established procedures.

Control Measures:

1. Case management: Individuals known to either have an infection with CRPA should receive appropriate antibiotic treatment. No decolonization strategies are established at the present time.

2. Contact management: Contact precautions should be instituted for patients known to have CRPA in acute care settings. Hand hygiene is at the core of prevention of transmission and must be emphasized. Device utilization should be minimized. Antimicrobial agents must be used exercising optimal clinical judgment and scientific evidence. Inappropriate antibiotics, incorrect antibiotics and/or incorrect dosing may lead to increased resistance.

3. Prevention: To prevent the spread of multi-drug resistance organisms (MDROs) in acute care settings, contact precautions should be instituted for patients known to have MDROs, including CRPA. In non-acute and/or long-term care settings, gowing and gloving should be done during secretion management, toileting and device manipulation. Unless the person represents a high risk for transmitting the organism, there is no need to restrict access to social and recreational activities. Education of staff about appropriate hand hygiene techniques, environmental cleaning and disinfection are crucial to prevent spread. Instituting solid antibiotic stewardship programs is indispensable to prevent further resistance development due to selective pressure.

4. Outbreak: Cohorting of staff and patients is recommended in the case of outbreaks. Surveillance cultures may or may not be helpful in the case of CRPA and will depend on specific scenarios. Chlorhexidine bathing has been found to be useful decreasing multidrug resistant healthcare associated infections and colonization rates, particularly in the ICU setting. This intervention may be particularly useful during an outbreak.

5. Precautions similar to those recommended for CRE by CDC should be observed. Please refer to CDCs toolkit at: https://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf.

Management of *Pseudomonas aeruginosa* infections in Child Care Centers

Refer to recommendations above.

References


What are *Pseudomonas aeruginosa* infections?
Infections caused by *P. aeruginosa* include but are not limited to:

- Blood infections.
- Heart valve infections.
- Lung infections.
- Infections of the urinary tract (kidneys and bladder).
- Bone infections.
- Body piercing infections.
- Hot tub skin rash.
- Nail infections.
- Swimmers ear.
- External ear infections.
- Eye Infections associated to trauma or contact lens use.

What are the symptoms of DISEASE? Symptoms will vary depending on the actual disease.

How is DISEASE spread? Most common transmission is via the hands of healthcare workers, caretakers or through contaminated equipment.

How long are people contagious? Individual factors determine the risk at which any person may be to acquire an infection with this organism. Serious infections are seen among individuals with underlying diseases. Duration of colonization rates are not known. There is no evidence that carriage persists beyond 6 months, except in the case of people with chronic pulmonary disease such as bronchiectasis and cystic fibrosis, who receive antibiotics on frequent bases.

Who gets DISEASE? The disease is most frequently seen among people with some degree of immunosuppression, nursing home residents and ICU patients. Risk factors for *P. aeruginosa* infections include age, heart disease, diabetes mellitus, chronic pulmonary disease, antibiotic use and invasive procedures.

What treatment is available for people with DISEASE? A variety of combinations may be tried in a clinical setting depending on the characteristics of the organism. A clinician with experience and training in Infectious Diseases should be consulted in these instances.

Do infected people need to be kept home from school, work or daycare? No

How can I protect myself and my family from getting *Pseudomonas aeruginosa*?

- Maintain healthy habits and life style, decreasing risks for chronic diseases.
- Exercise good hand hygiene and personal hygiene in general.
- Practice good cleaning and maintenance of potential sources for Pseudomonas contamination in the house. This include appropriate chlorine or bromide levels in hot tubs, cleaning humidifiers, respiratory therapy equipment used for inhalation of medications and air conditioning filters.
- Take antibiotics only when prescribed and according to the prescriber recommendation.
¿Qué son las infecciones causadas por *Pseudomonas aeruginosa*?

Las infecciones causadas por *P. aeruginosa* pueden incluir, aunque no están limitadas, a:

- Infecciones sanguíneas.
- Infecciones de la valvular del corazón.
- Infecciones pulmonares.
- Infecciones del tracto urinario (riñones y vejiga).
- Infecciones en los huesos.
- Infecciones causadas por piercings en el cuerpo.
- Erupciones en el cuerpo después de usar jacuzzi.
- Infecciones en las uñas.
- Infecciones en los oídos de los nadadores.
- Infecciones en los oídos externos.
- Infecciones en los oídos asociadas con un trauma o por el uso de lentes de contacto.

¿Cuáles son los síntomas? Los síntomas pueden variar dependiendo de donde sea la infección.

¿Cómo se transmiten estas infecciones? La manera más común de transmisión es a través de las manos de los trabajadores de la salud, cuidadores o a través de equipo contaminado.

¿Por cuánto tiempo puede alguien con estas infecciones contagiar a otros? El riesgo que tengan los individuos de adquirir una infección con este organismo está determinado por factores individuales. Las infecciones más serias se tienden a ver en individuos con enfermedades crónicas u otras dolencias. Aún no se conoce el tiempo que una persona puede permanecer colonizada por el organismo. Tampoco existe evidencia de que la colonización pueda durar más de seis meses, excepto en el caso de las personas con enfermedades pulmonares crónicas como la bronquiectasis, y la fibrosis cística, quienes reciben tratamiento antibiótico con frecuencia.

¿Quién puede contraer esta infección? Estas enfermedades son más comunes en las personas que tienen algún grado de inmunodepresión, los que residen en casas de cuidados, y los pacientes de cuidados intensivos. Los factores de riesgo asociados a infecciones con *P. aeruginosa* incluyen: la edad, enfermedades cardíacas, diabetes mellitus, enfermedades pulmonares crónicas, uso de antibióticos y procedimientos invasivos.

¿Cómo se trata la infección? Se pueden intentar una variedad de combinaciones de tratamientos en los hospitales, dependiendo de las características del organismo. En estos casos debe consultarse con un médico con experiencia y entrenamiento en enfermedades infecciosas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo? No

¿Cómo puedo protegerme yo y también proteger a mi familia contra las infecciones causadas por *Pseudomonas aeruginosa*?

- Mantenga hábitos y estilos de vida saludables que disminuyan los riesgos a las enfermedades crónicas.
- Mantenga siempre una buena higiene personal y lávese las manos con frecuencia.
- Limpie bien y hágale buen mantenimiento a las cosas en la casa que puedan servir de fuentes de infección con *Pseudomonas*. Esto incluye mantener niveles adecuados de cloro o boro en el agua de los jacuzzis, limpiar los humidificadores y los equipos usados para terapia respiratoria o para inhalación de medicamentos y los filtros de aire acondicionado.
- Tome antibióticos sólo bajo prescripción médica y de acuerdo a las recomendaciones de la receta.
Rabies

Summary
Rabies is a preventable viral disease of mammals most often transmitted to humans through the bite of a rabid animal. Rabies virus infects the central nervous system, causing encephalopathy, and ultimately death. Signs and symptoms include aggressiveness, apprehension, headache, fever, malaise, sensory changes, paralysis, foaming at the mouth, hydrophobia, delirium, and convulsions. The incubation period is usually one to three months but can range from less than one week to more than a year. Death occurs in nearly 100% of infected persons, and within days to months after symptom onset.

Agent
The rabies virus is a bullet-shaped, enveloped ribonucleic acid (RNA) virus in the genus Lyssavirus. In the United States (US), several distinct rabies virus variants have been identified in terrestrial mammals, including raccoons, skunks, foxes, and coyotes. In addition to these terrestrial reservoirs, several species of insectivorous bats are also reservoirs for distinct rabies variants.

Transmission
Reservoir:
Rabies can occur in any mammal. In New Mexico, skunks, bats, and more recently foxes in southwestern New Mexico are the reservoirs for the specific rabies variants that occur in the state and bites from these species are considered high risk. Raccoons are also a major reservoir for rabies in the eastern US. Occasionally there is spillover of these variants into other species such as unvaccinated dogs or cats. Rabies in small mammals (such as mice and squirrels) is rare and transmission from these species to humans has not been documented. Rabies in larger rodents, such as woodchucks, has been reported more frequently, primarily from the eastern US where raccoon rabies is epizootic. Rabies in humans is rare in the United States. There are usually only one or two human cases per year. But the most common source of human rabies in the United States is from bats. For example, among the 19 naturally acquired cases of rabies in humans in the United States from 1997-2006, 17 were associated with bats. Among these, 14 patients had known encounters with bats. Four people awoke because a bat landed on them and one person awoke because a bat bit him. In these cases, the bat was inside the home.

Mode of Transmission:
The virus is transmitted by the bite of an infected animal or infected saliva in contact with an open wound or mucous membrane. Rarely, organ transplantation cases have occurred from an infected donor.

Period of Communicability:
In dogs, cats, and ferrets, rabies virus is not present in the saliva more than a few days before clinical signs occur. If signs consistent with rabies do not occur in the biting dog, cat, or ferret within 10 days after a bite, it can be safely assumed that virus was not in the saliva at the time of the bite. No such determination has been made for other animals.

Clinical Disease
Incubation period:
In humans, the average incubation is one to three months but ranges from less than one week to more than one year.

Illness:

The first signs of rabies in humans may be nonspecific flu-like signs; malaise, fever, or headache, which may last for days. There may be discomfort or paresthesia at the site of exposure (bite), progressing within days to signs and symptoms of cerebral dysfunction, apprehension, aggressiveness, confusion, agitation, foaming at the mouth, hydrophobia, delirium, hallucinations, insomnia, and paralysis. The acute neurologic manifestation of disease typically ends after 10 days. Once clinical signs of rabies appear, the disease is nearly always fatal.

Diagnosis

- Definitive diagnosis of rabies for animal species can be made through a test of brain tissue by fluorescent antibody (FA) available at the New Mexico Department of Health Scientific Laboratory Division (SLD) in Albuquerque, 505-383-9124. See Appendix A for guidelines for head submission. According to state law, any biting wild animal other than a dog, cat, or ferret must be euthanized and submitted for laboratory testing if it cannot be proven that it was born and raised in captivity, and never had a chance to come in contact with another wild animal. Local animal control should consult with the Epidemiology and Response Division (ERD) at 505-827-0006 to determine if an animal needs to be euthanized and tested.

- Antemortem testing in humans requires several tests for confirmation. Tests are performed on samples of saliva, serum, spinal fluid, and skin biopsies of hair follicles at the nape of the neck. For suspected human cases, the physician should contact ERD for assistance in having samples sent to the Centers for Disease Control and Prevention (CDC) for testing.

- Animal Quarantine. Definitive diagnosis for dogs, cats, and ferrets can also be made through quarantine for 10 days after the bite. Definitive diagnosis for wild animals cannot be made through quarantine, and thus quarantine is not recommended for wild animals. Bites from horses and other livestock are evaluated on a case-by-case basis. If the livestock is acting normal and has no history of exposure to a rabid animal, it is usually recommended that the animal be quarantined and watched for 30 days. If it shows signs of rabies during the 30-day quarantine period, it is euthanized immediately, and the brain sent to SLD for testing. Quarantines are instituted using the procedures given in Appendix B.

- The risk of rabies can be estimated based on the health and behavior of the biting animal, vaccination status of the animal if appropriate, the amount of rabies in the species and geographic area, and on the circumstances of the bite situation. ERD should be consulted in all of these situations. See Appendix C for guidelines used in estimating the chances of an animal being rabid.

- SLD immediately reports animals that test positive for rabies to the submitter and to ERD. For negative rabies results, SLD phones the results within 24 hours to the submitter. The submitter, in turn, needs to notify other interested parties such as the bite victim, animal control officer, physician, veterinarian, or local health office.

Prophylaxis

1. How to Manage Persons Exposed to Potentially Rabid Animals
1.1. Bite exposure: State law requires anyone aware of an animal bite, including physicians, health offices, veterinarians, and the general public, to report them immediately to their local animal control office with a complete description of the biting animal and circumstances of bite. Bites from rodents or rabbits are extremely low risk for rabies and typically no investigation is conducted unless unusual circumstances exist (the animal was in contact with a known rabid animal and is exhibiting signs of rabies). Rodents and rabbits have not been documented to transmit rabies to humans.

1.1.a Wounds should be washed thoroughly to reduce potential rabies virus presence. Antibiotics may be considered for prevention or treatment of bacterial infection. The need for tetanus vaccine update or prophylaxis should be evaluated. Vaccination history of biting pets should be verified with veterinarians.

1.1.b If the biting animal has escaped, animal control should search for it in order for definitive determination of rabies status to be made by quarantine or laboratory testing. Due to the low risk of rabies in cats and dogs in New Mexico, animal control should be given 72 hours to search for a cat or dog. However, the search for an escaped biting animal should not continue for more than seven days after the date of the bite, at which time a decision whether to prophylax or not should be made. Rabies prophylaxis should be initiated within 24-48 hours of a high-risk bite situation (skunk, bat or other rabid acting animal), but can wait a few days for a low risk bite situation. A high-risk bite situation involving a head wound should have rabies prophylaxis initiated as soon as possible. ERD should be consulted to assist in determination of level of risk.

1.1.c The decision regarding prophylaxis of a bite victim in order to prevent development of rabies is made by the patient and personal physician, after consultation with the ERD. Recommendations for or against prophylaxis will be made based on the likelihood of rabies virus transmission. Rabies vaccine and immune globulin are available in New Mexico from the NMDOH Pharmacy through an order placed by ERD. A bill will be sent to the patient with the biologicals. Insurance information is also collected for the patient. Some hospitals carry their own supply of rabies vaccine and immune globulin in their pharmacy. The vaccine and immune globulin must be administered under the supervision of a physician (see prophylaxis regimen below).

1.2. Non-bite exposures: Rabies prophylaxis should be given to a person whose open wounds or mucous membranes come in contact with the saliva or neural tissue of a laboratory confirmed or suspected rabid dog or cat (see Appendix C). Prophylaxis should also be given for such contact with a skunk, bat or fox which is tested as rabies positive or cannot be tested. People usually know when they are bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations involving bats which may be considered non-bite exposures, such as:

1.2.a A person awakens to find a bat in the room.

1.2.b A bat is in a room near an unattended young child or mentally impaired or intoxicated individual.

In these situations, the bat should be caught by an animal control officer and sent in for testing. If the bat escapes or cannot be tested, then post-exposure prophylaxis may be indicated and ERD should be consulted.

2. Prophylactic regimen:
2.1. No previous rabies vaccinations. For those without pre-exposure prophylaxis, post-exposure rabies prophylaxis (PEP) consists of 1) human rabies immune globulin (HRIG) administered intramuscularly on day 0; and 2) four 1-mL doses of human rabies vaccine administered intramuscularly in the deltoid muscle on days 0 (same day as HRIG), 3, 7, and 14. For younger children, the outer aspect of the thigh may be used for rabies vaccine. The dose of HRIG is calculated as 0.0606 mL/lb. body weight (which converts to 20 IU per kilogram). Infiltrate as much of the dose of HRIG as anatomically possible into and around the site of the bite and inject the remainder intramuscularly in the deltoid or quadriceps (at a location other than that used for vaccine inoculation to minimize potential interference).

2.2. Because corticosteroids, other immunosuppressive agents, antimalarials, and immunosuppressive illnesses might reduce immune responses to rabies vaccines substantially, for persons with immunosuppression, rabies PEP should be administered using a 5-dose vaccine regimen (i.e., one dose of vaccine on days 0, 3, 7, 14, and 28). The patient should be managed in consultation with their physician and ERD as rabies virus-neutralizing antibody values may need to be checked to ensure that an acceptable antibody response has developed.

2.3. Previously rabies immunized. If post-exposure prophylaxis is indicated for a bite victim who has received the recommended pre-exposure regimen of human rabies vaccine, or has previously demonstrated rabies antibody, HRIG should not be given. Two one mL doses of rabies vaccine should be given intramuscularly on days 0 and 3.

 Surveillance

Case Definition:

Laboratory criteria - Detection by direct fluorescent antibody of viral antigens in a clinical specimen; or isolation of rabies virus from saliva, cerebrospinal fluid (CSF); or central nervous system tissue; or identification of a rabies-neutralizing antibody titer in the serum or CSF of an unvaccinated person.

Confirmed – a clinically compatible case that is laboratory confirmed.

Reporting:

Report all suspected or confirmed cases of rabies in humans or animals immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the CDC Possible Human Rabies Case Report Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

 Control Measures

1. Case management

1.1. Isolation: Contact isolation for oral secretions for the duration of illness. Immediate caregivers should be warned of the potential hazard of infection from saliva and should wear appropriate protection to avoid exposure from a patient’s saliva.

1.2. Prophylaxis: Not applicable.

2. Contact management
2.1. Isolation: None required.

2.2. Prophylaxis: Refer to “Prophylaxis” section for instruction on post-exposure prophylaxis.

3. Prevention

3.1. Immunization

3.1.a Dogs and cats. To reduce the risk of rabies infection and transmission in dogs and cats, the New Mexico Statutes and Regulations on Animal Control and Rabies requires rabies vaccination of all cats and dogs. Either the one-year or three-year vaccination protocol may be used based on the type of licensed vaccine administered. Documentation of vaccination by a veterinarian with a separate serially numbered certificate for each animal vaccinated is required. Information on each certificate should include: name of veterinarian, vaccine type, vaccine producer initials, name and address of owner, description of dog or cat vaccinated (i.e. gender, neuter status, color, breed, age); date of vaccination, and the expiration date for the period of immunity.

3.1.b Human Pre-exposure. Pre-exposure rabies prophylaxis (PRE-RP) is recommended for persons with increased risk of exposure to rabies virus. This includes veterinarians, animal control officers, professional trappers/hunters, and laboratory workers performing rabies testing. PRE-RP consists of three 1.0-mL injections of human rabies vaccine administered intramuscularly in the deltoid on days 0, 7, and either 21 or 28.

   o For those concerned about waning immunity, serum titers can be checked through: Department of Veterinary Diagnosis, Veterinary Medical Center, College of Veterinary Medicine, Kansas State University, Manhattan, Kansas 66502 (785-532-4483), http://www.vet.k-state.edu/depts/dmp/service/rabies/rffit.htm

   o A one mL booster dose should be administered only if the serum titer fails to maintain a value of at least complete neutralization at a 1:5 serum dilution by the rapid fluorescent focus inhibition test, because immune complex-like allergic reactions (such as rashes, urticaria, and arthus) can occur.

3.2. Other Preventive Activities

3.2.a Appendix D offers guidelines for pets that have contact with wild animals which could possibly be rabid, either by bringing home a dead carcass, or biting or being bitten by a wild animal, or fighting with a wild animal.

3.2.b New Mexico Game and Fish Department has regulations that forbid any importation of skunks or raccoons into the state, by anyone, including private citizens, pet shops, breeders, and hunters without a permit. Upon routine inspection of pet shops, animal control officers should request the purchasing records for skunks or raccoons. If they were purchased outside of New Mexico, the New Mexico Game and Fish Department should be notified.

Appendices

Appendix A. Guidelines for submitting animal heads for rabies testing to Scientific Laboratory Division (SLD)

Appendix B. Guidelines for quarantining biting dogs, cats, ferrets and livestock

Appendix C. Guidelines for estimating likelihood of a biting animal being rabid, for purposes of deciding on rabies treatment (Also consult ERD at 505-827-0006).

Appendix D. Guidelines for handling pets bitten by or interacting with wild animals
References

Compendium of Animal Rabies Prevention and Control, JAVMA • Vol 248 • No. 5 • March 1, 2016; 505-17.


CDC. Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies, Recommendations of the Advisory Committee on Immunization Practices. MMWR 2010; 59(No. RR-2).

New Mexico Administrative Code: Title 7, Health; Chapter 4, Disease Control Requirements (Epidemiology); Part 2 Animal Control Requirements. Available at: http://www.nmcpr.state.nm.us/nmac/parts/title07/07.004.0002.htm
Appendix A: Guidelines for submitting animal heads for rabies testing to Scientific Laboratory Division (SLD)

1. Testing is done by the Virology Section of the New Mexico Department of Health Scientific Laboratory Division (SLD), New Mexico Department of Health, 1101 Camino de Salud NE, Albuquerque, NM 87102, 505-383-9125.

2. The local animal control office or veterinarian can remove the head.

3. The heads should not be removed from bats; bats should be shipped whole. Bats must definitely be dead before shipping—hoping that they will smother in the shipping container is not sufficient.

4. Special metal containers supplied by SLD should be used. They are available at many animal control offices, local health offices, or from SLD. A sturdy Styrofoam container inside a cardboard box may be substituted if the metal container is not available. A rabies submission form and specific step-by-step instructions for packaging rabies specimens can be found on the SLD website: https://nmhealth.org/publication/view/help/1503/

5. The body and head should be refrigerated to prevent decomposition before shipping if shipping can be done within 72 hours of collection. If shipment will not occur until >72 hours, consult with the ERD regarding whether the specimen should be frozen prior to shipment.

6. The head should be shipped in the container along with a sufficient supply of ice packs.

7. Containers should be shipped as quickly as possible. The courier service should be used to ship containers from Monday – Thursday. Shipment of containers on Fridays or weekends should be done only after consultation with the ERD to determine the risk of rabies exposure. In low risk situations, the head should be kept refrigerated over the weekend and shipped on Monday.

8. Sometimes heads can be analyzed even if the animal has been dead for several days, particularly if the temperatures have been cold outside. If there is any chance brain tissue remains, find and/or dig up the biting animal and send the head to SLD.
Appendix B: Guidelines for quarantining biting dogs, cats, ferrets and livestock

1. Quarantine is preferable to testing heads as it eliminates the chance of shipping errors and laboratory errors. Local animal control has jurisdiction over where and how the quarantine is to be done.

2. The dog, cat, or ferret must be observed to remain healthy for 10 days after the bite. Livestock are evaluated on a case-by-case basis. If the livestock is acting normally and has no history of exposure to a rabid animal, it is usually recommended that the animal be quarantined and watched for 30 days.

3. If the pet or livestock becomes ill with signs of rabies during the quarantine, it must be euthanized and tested for rabies.

4. If it remains well, it is assumed to be rabies free.

5. Ideally, quarantine should take place at an animal control shelter, where chance of escape and contact with other animals or humans is eliminated. Livestock should be removed from open fields and penned up close to home where they can be observed daily.

6. If shelter quarantine for pets is not available, quarantine can take place elsewhere, such as at a veterinarian’s clinic, kennel, or someone’s home or fenced yard. However, these types of quarantine are less satisfactory, and must be approved by the local animal control officer.

7. Some jurisdictions may allow home quarantine of biting pets that are up-to-date on their vaccinations. (Up to date means having a current rabies certificate from a licensed veterinarian).
Appendix C: Guidelines for estimating likelihood of a biting animal being rabid, for purposes of deciding on rabies treatment (Consult Epidemiology and Response Division, 505-827-0006).

If definitive assessment of rabies status cannot be made for a dog or cat because it has escaped, rabies treatment is usually not recommended in New Mexico because of the low incidence of dog and cat rabies, unless there are factors to cause concern the pet may have been rabid.

Information supportive of a biting dog or cat not being rabid include:

1. Healthy appearance.
2. Male or unneutered animal.
3. Chronically vicious animal, repeat biter.
4. Vaccinated.
5. Owned.
6. Provoked bite, such as: riding bikes; surprising animal; touching animal; running; entering animal's yard, vehicle, or house; handling animal's food; breaking up animal fight; helping injured animal.
7. Rabies in dogs, cats, and other species is rare in this geographical area.

Information supportive of an animal being rabid include:

1. Animal appearing ill.
2. Dog or cat which bites without any provocation (see above.)
3. Dog or cat approached the person rather than the person approaching the pet.
4. Frenzied biting behavior, jumping from one person/animal to another to bite.
5. Dog or cat has spent much time in wild, possibly interacting with wild animals.
6. Dog or cat has never been vaccinated.
7. Presence of rabies in dogs and cats, or other species (specifically skunks or bats) in the area. One example is Mexico and Texas border counties. Dog and cat bites from these areas should be considered to have a higher risk of rabies exposure unless the animal is tested by a US laboratory or quarantined by a US animal control agency.

Similar information regarding the circumstance of the bite, species of biting animal, and rates of rabies in the area can be used in estimating the chances of a biting wild animal being rabid. However, because of the higher rate of rabies in bats, skunks, raccoons, and foxes, treatment is usually recommended for bites from these species when they cannot be laboratory tested. Pet raccoons and skunks which have escaped from their homes and thus could have been exposed to rabies are included in this classification. Bites from other species that rarely are rabid in New Mexico are evaluated on a case-by-case basis (e.g., bears, cattle, horses).
Appendix D: Guidelines for handling pets bitten by or interacting with wild animals

1. The biting wild animal is immediately destroyed, and the head shipped to SLD for testing.

2. Pending test results at SLD, the owner may be advised or required to have the pet vaccinated for rabies, regardless of previous vaccination history. This may not prevent an unvaccinated pet from getting rabies.

3. A quarantine at home or elsewhere, where human contact and chance of escape is minimized or eliminated, may be required or recommended (see below.)
   3.1. The lifetime vaccination history is reviewed by the local veterinarian, since this will partially determine the type of quarantine.
   3.2. The type of quarantine is directed by the local animal control officer (local ordinances vary but cannot be less restrictive than state regulations) and approved by ERD.
   3.3. Compliance with the quarantine will be enforced by the local animal control officer, who will also release the pet from quarantine when it is completed.

4. The enforcement of the quarantine is as follows:
   4.1. Head of wild animal negative for rabies—no quarantine necessary.
   4.2. Head of wild animal not available for testing, and pet has adequate lifetime vaccination history—recommend booster dose of vaccine and discuss 45-day observation period. However, this is probably not necessary.
   4.3. Head of wild animal not available for testing, and pet does not have adequate lifetime vaccination history (as determined by consultation with the ERD zoonoses team) recommend rabies vaccination and strongly recommend four-month quarantine.
   4.4. Head of wild animal is positive for rabies, and pet has adequate lifetime vaccination history—recommend euthanizing the pet or require revaccination and 45-day observation period.
   4.5. Head of wild animal is positive for rabies, and pet has never been vaccinated against rabies – strongly recommend euthanizing the pet or require a four-month strict isolation. Isolation in this context refers to confinement in an enclosure that precludes direct contact with people and other animals. Rabies vaccine should be administered upon entry into isolation to comply with pre-exposure vaccination requirements. Pets overdue for a booster vaccination will be evaluated on a case-by-case basis based upon severity of exposure, time elapsed since last vaccination, number of previous vaccinations, current health status, and local rabies epidemiology to determine the need for euthanasia or immediate revaccination and observation/isolation.

5. If it is uncertain whether a pet was bitten by a wild animal, test the wild animal if possible, vaccinate the pet, and suggest that a quarantine may be advisable (45-days if up-to-date or vaccinated previously, four months if not.)
What is rabies?
Rabies is a disease transmitted from animals to humans that is caused by a virus. Only mammals can get or transmit rabies (not birds, fish, reptiles, etc.). Some kinds of mammals, such as rodents and rabbits, have a very low probability of having rabies. The most common wild animals with rabies are bats, skunks, foxes, and raccoons. Unvaccinated domestic animals such as dogs, cats, ferrets, and some livestock may also become infected.

What are the symptoms of rabies?
Rabies can be prevented with vaccination and rabies post-exposure prophylaxis. Once symptoms begin, however, there is no cure or treatment. Symptomatic rabies is almost always fatal.

- In humans, the symptoms of rabies begin as a flu-like illness which quickly progresses to anxiety, confusion and agitation.
- In animals, symptoms of rabies vary greatly but can include behavioral changes, staggering, weakness, paralysis, seizures, aggression, and drooling.

How is rabies spread?
Rabies is almost always spread through the bite of an infected animal. It could also be spread by infectious material, such as saliva, coming into contact with mucus membranes (e.g. eyes, nose, mouth) or a cut in the skin. Rare cases of transmission through organ and tissue transplants have been reported. There has never been a documented case of human-to-human rabies transmission. Only the saliva and neural tissue of a rabid animal are infectious: rabies is not transmitted through contact with blood, urine, feces, fur, or skunk spray.

How long are people or animals contagious?
People providing care to a person with symptomatic rabies should use precautions to avoid contact with infectious material such as saliva.

People who have been in contact with a potentially rabid animal should consult with a healthcare provider and NMDOH to assess risk. Often testing or quarantining the biting animal is better than beginning post-exposure prophylaxis right away. An animal with signs of rabies will die within a few days.

Who gets rabies?
Human rabies cases are extremely rare in the United States. Most people who have contracted rabies in the U.S. were bitten by a rabid animal and did not tell a health care provider or get post-exposure prophylaxis. Anyone who has been bitten by a potentially rabid animal should consult with a health care provider and NMDOH to assess the need for post-exposure prophylaxis. Before international travel, people should consult with a health care provider to see what vaccinations are recommended for their destination.

Unvaccinated pets and livestock are at risk of contracting rabies. All dogs, cats, and ferrets must be vaccinated against rabies. Valuable livestock and animals that have frequent contact with humans (e.g. in petting zoos, fairs, etc.) should be vaccinated against rabies.

What treatment is available for people with rabies?
Once symptoms begin, rabies is almost always fatal. However, appropriate post-exposure prophylaxis is virtually 100% effective.

There is no rabies treatment or post-exposure prophylaxis for animals.
RABIES

Do infected people need to be kept home from school, work or daycare?

A person with symptomatic rabies would be too sick to go to school, work, or daycare. People who have been bitten by a potentially rabid animal should consult a healthcare provider and NMDOH but may go about their lives as usual. People who are undergoing post-exposure prophylaxis may also proceed as normal.

Why quarantine a dog, cat, or ferret that has bitten a person for 10 days instead of immediately testing the animal or beginning post-exposure prophylaxis?

Animals cannot transmit rabies unless the virus is present in saliva. Virus is usually only present in the saliva of an infected dog, cat, or ferret once signs of rabies begin, or at maximum three to four days before. If a dog, cat, or ferret remains healthy at the end of a 10-day quarantine period there is no risk of rabies transmission to the bite victim and unnecessary post-exposure prophylaxis can be avoided. No person in the United States has ever contracted rabies from a dog, cat, or ferret held in quarantine for 10 days. If a dog, cat, or ferret shows signs of illness at the time of the bite or during quarantine, it should be evaluated by a veterinarian and may be tested for rabies.

How can I protect myself and my family from getting rabies?

- Vaccinate all dogs, cats, and ferrets against rabies as required by law. Also vaccinate valuable livestock and livestock that have frequent contact with humans. Animals who seem sick or start behaving strangely should be evaluated by a veterinarian.
- Do not approach wildlife or unknown animals.
- Animal bites should be irrigated with clean water for several minutes and thoroughly cleaned with soap.
- Report all bites from dogs, cats, ferrets, or rabies-susceptible wildlife to local animal control. Consult with a health care provider and NMDOH to assess the appropriateness of having the animal tested or quarantined or beginning the patient on rabies post-exposure prophylaxis.
- International travelers should consult a health care provider to find out what vaccinations are recommended for their destination.
- People in high-risk professions (e.g. certain laboratory employees, those who work with wildlife, wild animal rehabilitators, veterinarians, animal control personnel) should receive rabies pre-exposure prophylaxis.
¿Qué es la rabia?
La rabia es una enfermedad causada por un virus que se transmite de animales a humanos. Sólo los mamíferos pueden contraer o transmitir rabia (no los pájaros, peces, reptiles, etc.) Algunos mamíferos, como los roedores y conejos, tienen muy baja probabilidad de contraer la rabia. Los animales salvajes que más comúnmente contraen rabia son los murciélagos, zorrillos, zorros y mapaches. Los animales domésticos que no han sido vacunados, como los perros, gatos, hurones, y algunos ganados, también pueden contraer la rabia.

¿Cuáles son los síntomas de una infección por rabia?
La rabia puede ser prevenida con una vacuna y la profilaxis anti-rábica después de una exposición. Sin embargo, no existe cura o tratamiento una vez que hayan comenzado los síntomas. La rabia sintomática casi siempre es mortal.

Los síntomas de la rabia en los humanos comienzan como una gripe que rápidamente progresa a síntomas de ansiedad, confusión y agitación.

Los síntomas de la rabia en animales pueden variar en gran medida, pero suele incluir cambios en el comportamiento del animal, desbalanceo, debilidad, parálisis, convulsiones, agresión y salivación.

¿Cómo se transmite la rabia?
La rabia casi siempre es transmitida por la mordedura de un animal infectado. También puede transmitirse a través del contacto directo de las membranas mucosas (e.g. ojos, nariz, boca) o una herida en la piel con material infectado, como la saliva. También se ha reportado, aunque muy rara vez, la transmisión por un trasplante de órganos o tejidos. Lo que nunca se ha demostrado es la transmisión de persona a persona. Solo la saliva o el tejido neural de un animal rabioso son contagiosos: la rabie no es transmisible por el contacto con sangre, orina, heces, pelaje, o spray de zorrillo.

¿Por cuánto tiempo puede alguien con rabia contagiar a otros?
Los trabajadores de la salud que provean cuidados a pacientes sintomáticos con rabia deben tener cuidado de no tener contacto con materiales infecciosos como la saliva del paciente.

Las personas que hayan tenido contacto con un animal potencialmente rabioso deben consultar con su médico y el Departamento de Salud para evaluar el nivel de riesgo de infección. Muchas veces es preferible hacerle la prueba de rabia al animal o aislarlo y observarlo en lugar de iniciar tratamiento profiláctico de inmediato. Un animal que tenga síntomas de rabia igual morirá en cuestión de días.

¿Quién puede contraer la rabia?
Los casos de rabia en humanos son extremadamente raros en los Estados Unidos. La mayoría de las personas en USA que se han contagiado con rabia fueron mordidos por un animal rabioso, pero no buscaron atención médica u obtuvieron tratamiento profiláctico luego de la exposición. Cualquiera que haya sido mordido por un animal potencialmente rabioso debe consultar con un médico y el Departamento de Salud para evaluar la necesidad de iniciar tratamiento profiláctico. Se recomienda que las personas consulten con un médico antes de hacer un viaje internacional para ver que vacunas son recomendadas para su lugar de destino.

Las mascotas y el ganado que no tengan las vacunas al día están en riesgo de contraer rabia. Todos los perros, gatos, y hurones deben ser vacunados contra la rabia. El ganado de valor y los animales que tengan contacto frecuente con los humanos (e.g. en zoológicos, ferias, etc.) deben ser vacunados contra la rabia.
¿Cómo se trata la rabia?

La rabia es casi siempre fatal una vez que han comenzado los síntomas. Sin embargo, el tratamiento profiláctico apropiado luego de una exposición es virtualmente 100% efectivo para prevenir la rabia.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?

Una persona que tenga rabia sintomática va a estar muy enferma como para ir a la escuela, centro de cuidado o sitio de trabajo. Las personas que hayan sido mordidas por un animal potencialmente rabioso deben consultar con un médico y el Departamento de Salud, pero pueden continuar sus actividades diarias como de costumbre. Las personas que estén recibiendo tratamiento profiláctico contra la rabia También pueden continuar sus actividades como de costumbre.

¿Por qué es necesario aislarse por 10 días a un perro, gato, o un hurón que haya mordido a una persona, en lugar de procesar al animal para hacerle prueba de la rabia o recomendar profilaxis luego de la exposición inmediatamente?

Un animal solo puede transmitir la rabia si el virus se encuentra en su saliva. El virus solo se encuentra en la saliva de un perro, gato u hurón infectado una vez que hayan comenzado los síntomas de la rabia en el animal, o a lo máximo tres a cuatro días antes. Si un perro, gato, u hurón todavía está saludable luego de 10 días de haber mordido a una persona, se considera que no hay riesgo de transmisión de rabia para la víctima de la mordedura, y se puede evitar empezar el tratamiento profiláctico. Nunca ha habido un caso en humanos que haya contraído la rabia de un perro, gato o hurón que no haya pasado los 10 días de aislamiento. Si un perro, gato u hurón muestra síntomas de estar enfermo al momento de morder a alguien o durante los 10 días de aislamiento, debe ser evaluado por un veterinario y puede ser que se necesite hacerle la prueba de la rabia.

¿Cómo puedo protegerme yo y proteger a mi familia contra la rabia?

- Vacuna a todos los perros, gatos y hurones contra la rabia tal y como lo establece la ley. Vacuna también al ganado de valor y el ganado que tiene contacto frecuente con humanos. Los animales que parezcan enfermos o comiencen a comportarse de manera extraña deben ser evaluados por un veterinario.
- No se le acerque a los animales salvajes o desconocidos.
- Las mordeduras de animales deben ser limpiadas con abundante agua y jabón por varios minutos.
- Reporte todas las mordeduras de perros, gatos, hurones, o cualquier animal que se susceptible a la rabia a su agente de control animal local. Consulte con un médico y el Departamento de Salud para evaluar la necesidad de hacerle la prueba de la rabia al animal o aislarlo o si es necesario comenzar tratamiento profiláctico.
- Los viajeros internacionales deben consultar con un médico para ver que vacunas son recomendadas para su lugar de destino.
- Las personas que trabajen en profesiones de alto riesgo (e.g. algunos empleados de laboratorio, los que trabajan con animales silvestres, los rehabilitadores de animales salvajes, veterinarios y los agentes de control animal) deben recibir vacunas preventivas antes de ser expuestos.
Rubella (German Measles)

Summary

Rubella is an infectious viral disease characterized by mild clinical disease, where cases are often subclinical, when symptomatic individuals may present with an erythematous maculopapular rash, lymphadenopathy and a low-grade fever. Infection with the rubella virus causes two distinct illnesses: congenital rubella syndrome (CRS) and postnatal rubella. Rubella virus occurs worldwide. It is most prevalent in winter and spring. In the United States, rubella has been largely controlled after the advent of immunization. The incidence of rubella in the U.S. has decreased by approximately 99% from the pre-vaccine era. Epidemic rubella in the U.S. last occurred in 1964.

Agent

Rubella virus is in the Togaviridae family, genus Rubivirus.

Transmission

Reservoir:

Humans.

Mode of transmission:

For postnatal rubella, direct or droplet contact with nasopharyngeal secretions of infected persons. Infants with CRS may shed virus in nasopharyngeal secretions and urine for one year or more and can transmit infection to susceptible contacts.

Period of communicability:

A few days to 7 days after the onset of rash. Infants with CRS may shed virus in nasopharyngeal secretions and urine for one year or more and can transmit infection to susceptible contacts.

Clinical Disease

Incubation period:

For postnatally acquired rubella, usually 16-18 days; range 14-21 days.

Illness:

Postnatal rubella is usually a mild disease with diffuse erythematous maculopapular rash, lymphadenopathy (commonly sub-occipital, postauricular and cervical) and fever. Adults sometimes have a prodromal illness of headache, malaise, coryza, and conjunctivitis. Arthralgias and arthritis can frequently complicate postnatal rubella, especially in females. Leukopenia and thrombocytopenia can occur, but hemorrhagic complications are rare. Encephalitis occurs more often in adult cases.

The most common anomalies in Congenital Rubella Syndrome are ophthalmologic (cataracts, retinopathy and congenital glaucoma), cardiac, auditory (sensorineural deafness) and neurologic (behavioral disorders, mental retardation, and meningoencephalitis). Infants often suffer from growth retardation and acutely after birth may have hepatosplenomegaly, thrombocytopenia, purpuric skin lesions (blueberry muffin syndrome), and radiolucent bone disease. Occurrence of congenital defects is 50% or greater if infection occurs during the first month of gestation, 20-30% if during the second month and 5% if during the 3rd or 4th month.
Laboratory Diagnosis

Serology is usually used for diagnosis. A positive rubella-specific IgM antibody or a significant rise in rubella-specific IgG antibody is indicative of infection. Sera should be collected as early as possible, but within 7-10 days of illness onset and then 2-3 weeks later for convalescent titers. Serum rubella IgM test results can be falsely positive in persons with other viral infections (e.g., acute infection with Epstein-Barr virus [infectious mononucleosis], recent cytomegalovirus infection, and parvovirus infection) or in the presence of rheumatoid factor.

Congenital infection can be confirmed by rubella-specific IgM in a newborn infant, but also by stable or rising rubella-specific IgG over several months.

Rubella virus can be detected using appropriate cell culture from nasal specimens, throat swabs, blood, urine, or cerebrospinal fluid (particularly in CRS).

Polymerase chain reaction (PCR) for rubella virus may be available from some laboratories.

Treatment

Supportive.

Surveillance

Case Definition:

Laboratory criteria- rubella infection confirmed by one or more of the following laboratory tests:

- Isolation of rubella virus;
- Detection of rubella-virus specific nucleic acid by polymerase chain reaction or
- IgG seroconversion or a significant rise between acute- and convalescent-phase titers in serum rubella IgG antibody level by any standard serologic assay or
- Positive serologic test for rubella IgM antibody (not explained by MMR vaccination during the previous 6-45 days and not otherwise ruled out by more specific testing in a public health laboratory).

Serum rubella IgM test results that are false positives have been reported in persons with other viral infections (e.g., acute infection with Epstein-Barr virus [infectious mononucleosis], recent cytomegalovirus infection, and parvovirus infection) or in the presence of rheumatoid factor.

Confirmed- A laboratory confirmed case with or without symptoms, or a person epi-linked to a laboratory confirmed case of rubella, or a case with illness characterized by all of the following:

- Acute onset of generalized maculopapular rash;
- Temperature greater than 99.0°F or 37.2°C;
- Arthralgia, arthritis, lymphadenopathy, or conjunctivitis;

Probable - In the absence of a more likely diagnosis, an illness characterized by all of the following:

- Acute onset of generalized maculopapular rash; and
• Temperature greater than 99.0°F or 37.2°C, if measured; and
• Arthralgia, arthritis, lymphadenopathy, or conjunctivitis; and
• Lack of epidemiologic linkage to a laboratory confirmed case of rubella; and
• Noncontributory or no serologic or virologic testing.

Suspected - Any generalized rash illness of acute onset that does not meet the criteria for probable or confirmed rubella or any other illness.

Epidemiologic Classification

Internationally imported case: An internationally imported case is defined as a case in which rubella results from exposure to rubella virus outside the U.S. This is evidenced by at least some of the exposure period (12–23 days before rash onset) occurring outside the U.S. and the onset of rash within 23 days of entering the United States (U.S.) and no known exposure to rubella in the U.S. during that time. All other cases are considered U.S.-acquired cases.

U.S.-acquired case: A U.S.-acquired case is defined as a case in which the patient had not been outside the United States during the 23 days before rash onset or was known to have been exposed to rubella within the U.S. These cases are subclassified into four mutually exclusive groups:

• Import-linked case: Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.
• Imported-virus case: Any case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported rubella genotype (i.e., a genotype that is not occurring within the U.S. in a pattern indicative of endemic transmission). An endemic genotype is the genotype of any rubella virus that occurs in an endemic chain of transmission (i.e., lasting ≥12 months). Any genotype that is found repeatedly in U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.
• Endemic case: A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of rubella virus transmission continuous for ≥12 months within the U.S.
• Unknown source case: A case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases. States may also choose to classify cases as “out-of-state-imported” when imported from another state in the U.S. For national reporting, however, cases will be classified as either internationally imported or U.S.-acquired.

Congenital Rubella Syndrome Case Definition:

Clinical case definition - An illness, usually manifesting in infancy, resulting from rubella infection in utero and characterized by signs or symptoms from the following categories:
- Cataracts/congenital glaucoma, congenital heart disease (most commonly patent ductus arteriosus or peripheral pulmonary artery stenosis), hearing impairment, pigmentary retinopathy.

- Purpura, hepatosplenoomegaly, jaundice, microcephaly, developmental delay, meningoencephalitis, radiolucent bone disease.

- Presence of any congenital defect(s) or laboratory data consistent with congenital rubella infection. Infants with congenital rubella syndrome usually present with more than one sign or symptom consistent with congenital rubella infection. However, infants may present with a single defect. Hearing impairment is the most common single defect.

Laboratory criteria - Isolation of rubella virus from clinical specimen, or infant rubella-specific IgG antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody or positive serologic test for rubella-specific IgM antibody or positive PCR from a clinical specimen.

Confirmed - A clinically consistent case that is laboratory confirmed.

Probable - A case that is not laboratory confirmed and that has any two complications listed in bullet one of the clinical case definition; or one complication from bullet one and one from the second bullet and lacks evidence of any other etiology.

Suspected - A case with some compatible clinical findings but does not meet the criteria for a probable case.

Infection only - A case that demonstrates laboratory evidence of infection, but without any clinical symptoms or signs.

Epidemiologic Classification of Internationally-Imported and U.S.-Acquired

Congenital Rubella Syndrome cases will be classified epidemiologically as internationally imported or U.S.-acquired, according to the source of infection in the mother, using the definitions below, which parallel the classifications for rubella cases.

Internationally imported case: To be classified as an internationally imported CRS case, the mother must have acquired rubella infection outside the U.S. or in the absence of documented rubella infection, if the mother was outside the U.S. during the period when she may have had exposure to rubella that affected her pregnancy (from 21 days before conception and through the first 24 weeks of pregnancy).

U.S. -acquired case: A U.S.-acquired case is one in which the mother acquired rubella from an exposure in the U.S. U.S.-acquired cases are subclassified into four mutually exclusive groups:

- Import-linked case: Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.

- Import-virus case: A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported rubella genotype (i.e., a genotype that is not occurring within the U.S. in a pattern indicative of endemic transmission). An endemic genotype is the genotype of any rubella virus that occurs in an endemic chain of transmission (i.e., lasting ≥12 months). Any genotype that is found repeatedly in U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.
Endemic case: A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of rubella virus transmission continuous for ≥12 months within the U.S.

Unknown source case: A case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

Reporting: Report all suspected or confirmed cases of rubella or CRS to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Complete the CDC Rubella Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

The goal of controlling rubella infections is to prevent birth defects in the fetuses of susceptible mothers.

1. Case management
   
   1.1. Isolation: Standard and droplet precautions are recommended for seven days following the onset of rash. Contact precautions are required for up to one year for children with CRS, unless nasopharyngeal and urine cultures after three months of age are repeatedly negative.
   
   1.2. Prophylaxis: Not applicable.

2. Contact management
   
   2.1. Isolation: None required.
   
   2.2. All contacts should be traced with particular attention to pregnant or potentially pregnant contacts.
   
   2.3. Pregnant contacts should be tested for rubella susceptibility or early infection.
   
   2.4. Prophylaxis: Immune globulin (IG) has been used for post-exposure prophylaxis in early pregnancy for exposed susceptible women in whom termination of pregnancy is not an option. If given early after exposure in the first trimester, IG may modify or suppress signs and symptoms; however, the benefits of using rubella specific IG is unknown.
   
   2.5. Immunization of contacts, while not contraindicated (except during pregnancy when live virus immunization should not be used), may not necessarily prevent infection or illness.

3. Prevention
3.1. Routine immunization is the primary mechanism to control rubella infection. Rubella vaccine is a live, attenuated virus vaccine. Typically, it is combined with measles and mumps into the MMR vaccine. The immunization is recommended for children aged 12-15 months, followed by a second immunization preferably at 4-6 years of age or 11-12 years of age. Over 95% of those vaccinated aged 12 months and older develop serologic evidence of rubella immunity after a single dose.

3.2. Emphasis should be placed on the immunization of at-risk persons, including health care workers, child care workers, other persons who have contact with young children or congregate at institutions (e.g., colleges, military sites), and foreign-born persons (especially women of reproductive age). Those persons who have not received at least one dose of vaccine or who have no serologic evidence of immunity are considered susceptible and should be immunized with MMR vaccine.

3.3. Postnatal rubella cases occurring in the first trimester of pregnancy should be counseled concerning risk to the fetus.

**Managing Rubella in Child Care Centers and Schools**

Adults or children with postnatal rubella should be excluded from work, school, or child care for seven days following the onset of rash.

All persons having contact with a child with CRS should be assured to be immune to rubella. CRS children can shed virus for prolonged periods (up to one year of age). Children with CRS in child care should be considered contagious until they are at least one year old, unless nasopharyngeal and urine cultures are repeatedly negative for rubella virus.

**References**


What is rubella?
Rubella (German Measles) is a relatively mild, three-day illness caused by a virus. However, it is especially dangerous in women infected during the first few months of pregnancy because the virus can severely damage the unborn baby.

What are the symptoms of rubella?
Rubella is usually a mild illness, with a slight fever, swelling of the lymph glands (especially those in the back of the neck) and a rash that lasts for three days. Symptoms usually appear 16 to 18 days after exposure, with a range of 14 to 23 days. Sometimes children do not develop any symptoms, but adults may have a low-grade fever, headache, weakness, runny nose and red eyes. Some people also get temporary swelling and pain in the joints.

How is rubella spread?
Rubella is spread in droplets from the nose or throat of an infected person, usually when a person coughs or sneezes. It can also spread by direct contact with saliva and discharges from the nose and throat of an infected person.

How long are people contagious?
Persons infected with rubella are contagious from about one week before the appearance of the rash through seven days after the appearance of the rash.

Who gets rubella?
Persons who do not receive the rubella vaccine are the most likely to get this disease. Persons who receive two doses of the measles-containing vaccine (measles, mumps, rubella or MMR) are much less likely to be infected.

What treatment is available for people with rubella?
There is no specific treatment for rubella. Supportive care should be given as needed.

Do infected people need to be kept home from school, work or daycare?
People should stay home from work, school, daycare or other settings where others could be exposed until seven days after onset of rash.

How can I protect myself and my family from getting rubella?
- Keep your children up to date on their immunizations.
- Women of child bearing age should be fully immunized and advised to delay becoming pregnant for at least three months following immunization.
- Pregnant females who have contact with a person with rubella during their first few months of pregnancy should have their blood tested for infection or immunity and be given advice by their doctor.
- Both male and female health care workers should be immunized against rubella, unless they can provide evidence of immunization or disease.
¿Qué es la rubéola?
La rubéola es una enfermedad que dura tres días, está causada por un virus y es relativamente leve. Sin embargo, puede ser especialmente peligrosa en las mujeres embarazadas que contraen la infección en los primeros meses de embarazo porque puede dañar gravemente al bebé.

¿Cuáles son los síntomas de la rubéola?
La rubéola suele ser una enfermedad leve, con un poco de fiebre, inflamación de los ganglios linfáticos (especialmente los que están en la nuca) y un sarpullido que dura tres días. Los síntomas aparecen normalmente entre 16 y 18 días después de haber estado expuesto, pero su aparición puede variar de 14 a 23 días. A veces los niños no desarrollan síntomas, pero los adultos pueden tener una fiebre baja, dolor de cabeza, debilidad, nariz mocosa y ojos enrojecidos. Algunas personas también pueden tener hinchazón y dolor en las articulaciones de forma temporal.

¿Cómo se transmite la rubéola?
La rubéola se transmite a través del aire por las gotitas que una persona enferma expulsa de su nariz o garganta, por lo general al toser o estornudar. También se puede transmitir por contacto directo con la saliva y secreciones de la nariz o la garganta de la persona infectada.

¿Por cuánto tiempo puede alguien con rubéola contagiar a otros?
Las personas infectadas con rubéola son contagiosas desde una semana antes de aparecer el sarpullido hasta una semana (de 5 a 7 días) después de su aparición.

¿Quién puede contraer la rubéola?
Las personas que no recibieron la vacuna de la rubéola tienen más posibilidades de contraerla. Si ya se recibieron dos dosis de la vacuna triple viral (sarampión, paperas y rubéola), es menos posible.

¿Cómo se trata la rubéola? No hay un tratamiento específico para la rubéola. Tratamiento de apoyo se puede ayudar a aliviar los síntomas.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Sí. Hasta que hayan pasado 7 días después de la aparición del sarpullido, las personas no deben ir al trabajo, a la escuela, a la guardería o a otros lugares donde puedan exponer a otros a la enfermedad.

¿Cómo puedo protegerme yo y proteger a mi familia contra la rubéola?
- Mantenga al corriente las vacunas de sus niños.
- Las mujeres que estén en edad de poder quedar embarazadas deben recibir la vacuna y esperar al menos tres meses después de recibirla antes de intentar quedar embarazadas.
- Las mujeres embarazadas que hayan tenido contacto con una persona con rubéola durante los primeros meses de su embarazo deben ir al médico para que les hagan un análisis de sangre y chequee si tienen la infección o la inmunidad y proceder según corresponda.
- Los trabajadores de la salud (hombres y mujeres), deben vacunarse contra la rubéola a menos que presenten prueba de que tienen la inmunidad o de que ya pasaron la enfermedad.
Salmonellosis (nontyphoid)

Summary

*Salmonella* infection most commonly causes acute gastroenteritis although people with long term carriage can be asymptomatic. Most infections are acquired by ingestion of contaminated food or water (particularly raw eggs or milk), or by cross contamination during food handling (particularly raw poultry). Laboratory diagnosis is made by stool culture. Antimicrobial treatment of gastroenteritis is usually not indicated, unless the patient is at risk for invasive disease. Symptomatic cases should be excluded from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Disease can be prevented by proper food preparation and by using good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

Agent

There are more than 2,500 known serotypes of *Salmonella*, although in the United States the 100 most common serotypes account for about 98% of all reported cases. In 2017, the five most common serotypes of *Salmonella* reported in New Mexico were *Salmonella newport*, *Salmonella typhimurium*, *Salmonella enteritidis*, *Salmonella javiana*, and *Salmonella orienburg*.

Transmission

Reservoir:

*Salmonella* have been found in symptomatic and asymptomatic domestic and wild animals, including poultry, swine, cattle, rodents, and pets such as snakes, iguanas, turtles, chicks, dogs, and cats. Humans may also serve as a reservoir for *Salmonella* infections.

Mode of Transmission:

Salmonellosis usually results from handling or eating undercooked or raw products of animal origin, such as eggs, milk, meat and poultry. However, recent outbreaks have been associated with fresh produce (e.g., tomatoes, alfalfa sprouts and cantaloupe) and unpasteurized juices. *Salmonella* can also be spread from person to person or through direct contact with an infected animal, such as reptiles or baby poultry.

Period of Communicability:

Throughout the course of infection, ranging from several days to several weeks. Some persons, particularly infants, may develop a temporary carrier state, which may continue for months. About 1% of adults and 5% of children under five years old may excrete the organism for more than one year. Antimicrobial therapy can prolong excretion.

Clinical Disease

Incubation period:

Usually 12-36 hours, with a range of 6-72 hours.

Illness:

The gastrointestinal illness is characterized by an acute onset of headache, abdominal pain, diarrhea, nausea, and sometimes vomiting. Dehydration, especially among infants, may be severe. Fever is nearly always present. Anorexia and diarrhea often persist for
several days. The diarrhea is self-limited and most patients recover within 10 days. Infection may begin as an acute enterocolitis and develop into septicemia or focal infection. Occasionally, the organism localizes in tissue to produce abscess, septic arthritis, cholecystitis, endocarditis, meningitis, or pneumonia.

**Laboratory Diagnosis**

- The diagnosis of salmonellosis is usually established via a stool culture. Other clinical specimens (e.g., urine or blood) may also be used to confirm the diagnosis. Stool samples should be submitted in enteric pathogen transport media that contains preservative. Fresh stool specimens are preferred over rectal swabs.

- *Salmonella* bacteria may be excreted in the stool for several days or weeks after the acute phase of illness. Therefore, cultures taken after the acute phase of illness may be useful in establishing the diagnosis of salmonellosis or for detecting asymptomatic infections.

- Serologic tests are not useful in diagnosis.

- Culture Independent Diagnostic Testing (CIDT) is becoming a common method for diagnoses. CIDT is a PCR test with approximately 1-hour turn-around time, which makes it appealing, however, the PCR is run as a GI panel and often result in detection of several conditions. Investigations and reflex culture are required to confirm these results.

**Treatment**

- Antimicrobial therapy is usually not indicated for patients with uncomplicated (noninvasive) gastroenteritis caused by nontyphoidal *Salmonella* species, as therapy does not shorten the duration of disease and may prolong the excretion of organisms. Although of unproven benefit, antimicrobial therapy is generally recommended for *Salmonella* gastroenteritis in patients who are at risk for developing invasive disease, including infants younger than three months of age and persons with malignancies, sickle cell anemia, HIV, or other immunosuppressive illnesses.

- For invasive (extra-intestinal) *Salmonella* infections (such as bacteremia or osteomyelitis), appropriate antimicrobial therapy includes ampicillin, cefotaxime, chloramphenicol, trimethoprim-sulfamethoxazole (TMP-SMX), or a fluoroquinolone, depending on the susceptibility of the organism.

- Treatment decisions should be made in conjunction with the patient’s health care provider.

**Surveillance**

**Case Definition:**

- *Laboratory criteria* - Isolation of *Salmonella* from a clinical specimen.

- *Confirmed* – A case that is culture confirmed.

- *Probable* – A case that is positive by CIDT methods without culture confirmation or a clinically compatible case that is epidemiologically linked to a confirmed case.

**Reporting:**
Report all suspected, probable or confirmed cases of *Salmonella* to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the Foodborne Surveillance Investigation to complete the investigation. Investigation information should also be entered into NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio > STEC > Cryptosporidium > Salmonella > Shigella > Campylobacter > Cyclospora > Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. Case management
   1.1. Isolation:

   Exclude symptomatic persons from food handling and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. The person may be allowed to resume his/her usual duties when:

   - Diarrhea has resolved, and
   - Proper hygiene measures can be maintained (as assessed by a food sanitarian, trained environmentalist, or infection control practitioner), and
   - They have two negative stool cultures at least 24 hours apart, with the first taken at least 48 hours after completion of antibiotic therapy, if given. If a stool culture is positive, then it should be repeated until negative.

   Exclusion of asymptomatic infected persons (i.e., carriers) from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients may be indicated if their food handling or personal hygiene habits (as assessed by a food sanitarian, trained environmentalist, or infection preventionist) are inadequate to prevent transmission of enteric infection to patrons or patients. They need not be excluded from work if proper hygiene measures are maintained.

   For hospitalized patients, contact precautions should be used for handling feces and contaminated clothing and bed linen.

   1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. Isolation:

   Stool cultures should be obtained from household contacts who are involved in food handling or direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Persons with positive cultures should be managed as above (section 1.1).

   2.2. Prophylaxis: Not applicable.
3. Prevention:

3.1. Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

3.2. General guidelines for preventing foodborne illness include:

3.3. Thoroughly cook raw food from animal sources.

3.4. Wash raw vegetables.

3.5. Avoid unpasteurized dairy products.

3.6. Wash hands, knives, and cutting boards after handling uncooked foods.

3.7. Immunization: Not applicable.

Managing *Salmonella* in Child Care Centers

Outbreaks of *Salmonella* infection in child care centers are uncommon.

Management of sporadic cases

When a case of *Salmonella* occurs among a child care center attendee, that child should be excluded until s/he is asymptomatic and the stools are formed. Since children (and adults) may shed *Salmonella* for weeks to months after an acute infection, and because outbreaks of *Salmonella* in child care settings are rare, it is reasonable to allow asymptomatic children to return to the child care center without follow-up stool cultures.

Per child care licensing regulations, a center should notify parents or guardians in writing of a case of *Salmonella* in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 7 for a notification letter template.

When a case of *Salmonella* occurs among a child care center staff member, that person should be excluded from their work duties until they are asymptomatic as defined above.

A case of salmonellosis in a child care facility should prompt the search for other cases among children and staff members of the facility, as well as household members or other close contacts of the index case. Stool cultures should be obtained on other symptomatic persons.

The child care center should review its infection control protocols with staff, and emphasize the following:

Standard precautions should be followed. Strict hand washing routines for staff and children and routines for handling fecally contaminated materials.

Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).

Food handling and diaper changing areas should be physically separated and cleaned daily.

Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute one cup bleach in nine cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.

- Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation, but are recommended whenever a day care attendee is diagnosed with
an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

If an outbreak of salmonellosis (i.e., two or more cases) is suspected in a child care facility, ERD should be notified immediately. Outbreaks of *Salmonella* in this situation would ordinarily be controlled by exclusion of symptomatic children and staff.

**References**


What is salmonellosis?
Salmonellosis is caused by *Salmonella* bacteria, typically found in intestines or stomach and occasionally the bloodstream.

What are the symptoms of a Salmonella infection?
The most common symptoms are mild or severe diarrhea, fever, abdominal pain, headache, and occasionally vomiting. Blood infections can be quite serious, especially in the very young or elderly. The symptoms generally appear 1 to 3 days after exposure.

How is salmonellosis spread?
Salmonella bacteria may be spread by eating contaminated or “dirty” water or food (particularly undercooked eggs and poultry). Infected persons can spread the bacteria by not washing their hands after going to the bathroom and then handling food. Direct contact with stool (feces) from an infected person or animal and transferred to the mouth from the hands may also cause infection.

How long are people contagious?
Most persons carry the bacteria for several days to several weeks after illness. A small percentage of infected persons carry the bacteria for a year or longer.

Who gets salmonellosis?
Anyone can get salmonellosis but it is recognized more often in infants and children. Because there are many different strains of *Salmonella*, salmonellosis can re-occur throughout a person’s lifetime.

What treatment is available for people with salmonellosis?
Most *Salmonella* infections will go away without treatment. Persons with diarrhea should drink plenty of fluids. However, if the *Salmonella* has invaded a person's bloodstream, your health care provider may recommend treatment with antibiotics.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria is found in stool, children should not go to daycare or school while they have diarrhea and food handlers should be excluded from work. Daycare attendees and workers may return to the daycare setting once they are asymptomatic. Food handlers may return to work after two negative stool culture results and the approval of public health, or if 30 days have passed since symptoms resolved.

How can I protect myself and my family from getting salmonellosis?
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Avoid food or water from sources that may be contaminated.
- Wash raw fruits and vegetables prior to eating or chopping.
- Always treat raw poultry, beef and pork as if they are contaminated and handle accordingly.
- Wrap fresh meats in plastic bags at the market to prevent blood from dripping on other foods.
- Refrigerate foods promptly; minimize time kept at room temperature.
- Immediately washing cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached, particularly when cooking in a microwave.
- Avoid chicks, ducklings, turtles and other reptiles as pets for small children.
¿Qué es la salmonelosis?
La salmonelosis es una enfermedad causada por una bacteria que se llama Salmonella. Suele afectar a los intestinos o estómago y en ocasiones puede ocasionar una infección en la sangre.

¿Cuáles son los síntomas de una infección por salmonella?
Los síntomas más comunes son: diarrea (puede ser leve o grave), fiebre, dolor abdominal, dolor de cabeza y, en ocasiones, vómitos. Las infecciones en la sangre pueden ser bastante graves, sobre todo en niños muy pequeños o en personas mayores. Los síntomas suelen aparecer entre 1 y 3 días después de la exposición.

¿Cómo se transmite la salmonelosis?
La bacteria de la Salmonella se puede transmitir al tomar agua o comer alimentos contaminados (en especial huevos o carne de ave que no se cocinaron bien). Las personas infectadas pueden transmitir la bacteria si no se lavan las manos después de usar el baño y entonces manipulan los alimentos que otros van a comer. Otra forma de contraer esta infección es por contacto directo al tocar las heces de un animal o una persona infectada y después tocarse la boca, así se pasa la bacteria de las manos a la boca.

¿Por cuánto tiempo puede alguien con salmonelosis contagiar a otros?
La mayoría de las personas pueden seguir teniendo la bacteria por varios días y hasta varias semanas después de haberse enfermado. Un número pequeño de personas puede tener la bacteria por un año o más.

¿Quién puede contraer la salmonelosis?
Cualquiera puede contraerla pero es más fácil que ocurra en bebés y niños. Como hay muchos tipos (cepas) diferentes de la bacteria Salmonella, la salmonelosis puede ocurrir de nuevo en la vida de una persona.

¿Cómo se trata la salmonelosis?
La mayoría de las infecciones por Salmonella desaparece sin tratamiento. Si se tiene diarrea, es importante beber muchos líquidos. Sin embargo, si la infección pasa a la sangre, su médico le puede recomendar tratamiento con antibióticos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Puesto que la bacteria está presente en las heces, los niños no deben ir a la escuela ni a la guardería mientras tengan diarrea, ni las personas que trabajen manipulando alimentos deben ir al trabajo. Los niños y trabajadores de la guardería pueden regresar a la guardería cuando se recuperen. Los manipuladores de alimentos pueden regresar al trabajo cuando reciban 2 resultados negativos en su prueba de heces y tengan la aprobación de la salud pública.

¿Cómo puedo protegerme yo y proteger a mi familia contra la salmonelosis?
Para reducir las posibilidades de tener contacto con la Salmonella, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Evite tomar agua o alimentos que puedan venir de fuentes contaminadas.
- Lave las frutas y verduras crudas antes de comerlas o cortarlas.
- Siempre trate la carne de aves (como el pollo o pavo), res y puerco con precaución, como si estuviera contaminada, y manipule de forma adecuada.
- Cuando esté comprando, ponga la carne cruda dentro de bolsas de plástico para que la sangre de ésta no se mezcle con otros alimentos.
- Ponga los alimentos en el refrigerador cuanto antes, deben estar a temperatura ambiente el mínimo tiempo posible.
- Lave inmediatamente los tableros para cortar y mostradores que usó para preparar estos alimentos, así evita que otros alimentos se puedan contaminar.
- Cuando cocine, asegúrese de que los alimentos alcancen la temperatura de cocción interna correcta, sobre todo si usa un microondas.
- No les dé pollitos, patitos, tortugas u otros reptiles como mascotas a los niños pequeños.
**Shigellois**

**Summary**

Shigellois is a diarrheal disease caused by a group of bacteria called *Shigella*. Illness is often characterized by diarrhea, fever, nausea, and sometimes vomiting and cramps; mild and asymptomatic infections can occur. Stools often contain blood and mucus. Most infections are acquired by fecal-oral transmission from an infected person or from fecal contamination of water or food. Laboratory diagnosis is made by stool culture or culture independent testing (CIDT). Antimicrobial treatment will shorten duration of illness and reduce shedding of the organism.

Symptomatic cases should be excluded from food handling, and from direct care of infants, elderly, immunocompromised, hospitalized and/or institutionalized patients; infected children or staff in a child care center should also be excluded. Antimicrobial treatment should be considered for these persons. A symptomatic case who performs these duties may return to his/her usual duties when the diarrhea has ceased, and they have two consecutive negative fecal samples or rectal swabs collected at least 24 hours apart, and at least 48 hours after completion of antibiotic therapy.

**Agent**

Shigellois is caused by of any of the four species of the *Shigella* bacillus: Group A, *S. dysenteriae*; Group B, *S. flexneri*; Group C, *S. boydii*; or Group D, *S. sonnei*. In the United States, Group D (*S. sonnei*) is the most common species; Group B (*S. flexneri*) accounts for the majority of the remainder of cases.

**Transmission**

Reservoir:

The only significant reservoir is humans, although other primates may be infected.

Mode of transmission:

By direct or indirect fecal-oral transmission from an infected patient or carrier. Modes of transmission are: person to person contact, contact with a contaminated inanimate object, ingestion of contaminated food or water, and sexual contact. Foodborne or waterborne epidemics have occurred from direct fecal contamination of communal sources. Houseflies can transfer organisms from infected feces to uncovered food items. The infective dose of *Shigella* is small (10 to 200 organisms).

Period of communicability:

*Shigella* bacilli are shed during the acute phase of the illness and usually ceases within four weeks of onset of illness. Asymptomatic carriers may shed the organism for up to one month, and chronic carriage is uncommon. Secondary attack rates in households are high, up to 40%. Outbreaks commonly occur under conditions of crowding and poor sanitation, such as in correctional facilities, institutions for children, day care centers, mental hospitals, crowded camps, and aboard ships.

**Clinical Disease**

Incubation period:

Usually 1-3 days, with a range of 1-7 days.
Illness:

Shigellosis is an acute bacterial disease involving the large and small intestine. Illness is characterized by diarrhea, sometimes accompanied by fever, malaise, nausea, vomiting and cramps. Typically, the stools contain blood and mucus, although mild infections consisting only of watery diarrhea may also occur. Seizures can be a complication, particularly in children. Although illness is usually self-limited, lasting an average of 4-7 days, severe infections may occur in young children, the elderly, and in persons with poor nutritional status. Rare complications include bacteremia, Reiter’s Syndrome (with *S. flexneri*), toxic megacolon and hemolytic-uremic syndrome (with *S. dysenteriae*).

**Laboratory Diagnosis**

Diagnosis of shigellosis is established via a stool culture or CIDT using fresh feces or a rectal swab, preferably collected within four days of symptom onset. Please note, culture confirmation of CIDT-positive specimens is ideal, although it may not be possible in all instances.

A stool smear stained with methylene blue often demonstrates numerous polymorphonuclear leukocytes, indicative of colitis but not specific to *Shigella* diagnosis.

Subtyping of *S. sonnei* by pulsed field gel electrophoresis (PFGE), when performed, can improve outbreak detection and control.

An enzyme immunoassay (EIA) for shiga-toxin can be useful for rapid detection of *S. dysenteriae*, type 1, often associated with more serious disease and complications.

**Treatment**

Antimicrobial therapy is effective for shortening the duration of diarrhea and eradicating organisms from feces. Treatment should be used in patients with severe symptoms (such as dysentery). For patients with mild illness, treatment may be indicated to prevent the spread of the organism (such as in a child care setting or for food handlers). Because multidrug resistance is common among *Shigella*, antimicrobial susceptibility testing should be performed. Antimicrobial therapy should be administered for five days. Anti-motility or antidiarrheal medications are contraindicated for children and their use discouraged in adults. Treatment decisions should be made in conjunction with the patient’s health care provider.

**Surveillance**

**Case Definition:**

*Clinical description:* An illness of variable severity characterized by diarrhea, fever, nausea, cramps, and tenesmus. Asymptomatic infections may occur.

*Laboratory Criteria:* Confirmed laboratory evidence: Isolation of *Shigella* from a clinical specimen. Supportive laboratory evidence: Detection of *Shigella* spp. or *Shigella* enteroinvasive E. coli (EIEC) in a clinical specimen using CIDT.

*Criteria to Distinguish a New Case from an Existing Case:* A case should not be counted as a new case if laboratory results were reported within 90 days of a previously reported infection in the same individual. When two or more different serotypes are identified in one or more specimens from the same individual, each should be reported as a separate case.

*Epidemiologic Linkage:* A clinically compatible case that is epidemiologically linked to a case that meets the supportive or confirmatory laboratory criteria for diagnosis.
**Confirmed Case:** A case that meets confirmed laboratory criteria for diagnosis. When available, O antigen serotype characterization should be reported.

**Probable Case:** A clinically compatible case that is epidemiologically linked to a confirmed case. OR a case that meets the supportive laboratory criteria for diagnosis.

**Reporting:**

Report all suspected or confirmed cases to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation:**

Use the Foodborne Surveillance Investigation Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

**Control Measures**

Control measures for CIDT cases that tested positive for more than one condition should be prioritized as follows: Vibrio > STEC > Cryptosporidium > Salmonella > Shigella > Campylobacter > Cyclospora > Giardia.

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 8.

1. **Case management**
   1.1 Isolation: Exclude symptomatic persons from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. Antimicrobial treatment should be considered for these persons. They may be allowed to resume usual duties when diarrhea has resolved and there are two consecutive negative fecal samples or rectal swabs, collected at least 24 hours apart, and at least 48 hours after completion of antibiotic therapy.
      1.1.a For hospitalized patients, contact precautions, in addition to standard precautions, should be used.
   1.2 Prophylaxis: Not applicable.

2. **Contact management**
   2.1 Isolation: Ill contacts of shigellosis patients should also be excluded from food handling, and from direct care of infants, elderly, immunocompromised, hospitalized and/or institutionalized patients. Contact should not resume until diarrhea ceases and two consecutive fecal samples or rectal swabs, collected at least 24 hours apart and at least 48 hours after completion of antibiotic therapy, are negative.
   2.2 Prophylaxis: Not applicable.

3. **Prevention**
   3.1 Emphasize good hand hygiene practices (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food or beverages).
   3.2 Follow general guidelines for preventing foodborne illness including:
      3.2.a Thoroughly cook raw food from animal sources.
      3.2.b Wash raw vegetables.
3.2.c Minimize contamination of food and surfaces by houseflies.
3.2.d Wash hands, knives and cutting boards after handling uncooked foods.

3.3 Immunization: Not applicable.

3.4 Symptomatic cases should consider avoiding recreational water usage for two weeks after the resolution of diarrheal illness to decrease waterborne transmission of *Shigella*.

**Managing Shigellosis in Child Care Centers**

1. Outbreaks of shigellosis in child care centers do occur and can be difficult to control, particularly among groups of young children who are not yet toilet trained.

2. Management of isolated cases

   2.1 When a case of shigellosis occurs among a child care center attendee or staff member, stool specimens from other symptomatic attendees and staff members should be cultured. Stool specimens from household contacts who have diarrhea should also be cultured.

   2.2 All symptomatic persons who have *Shigella* isolated or detected from their stool should be given antimicrobial therapy to prevent further transmission. They also should be excluded until the diarrhea has resolved, and there are two consecutive negative fecal samples or rectal swabs taken at least 24 hours apart, and at least 48 hours after completion of antibiotic therapy.

   2.3 Per child care licensing regulations, a center should notify parents or guardians in writing of a case of *Shigella* in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 7 for a template of a notification letter.

   2.4 The child care center should review its infection control protocols with staff, and emphasize the following:

      2.4.a Standard and enteric precautions should be followed to include strict hand washing routines for staff and children, and routines for handling fecal contaminated materials. Wash hands with soap and water. Waterless hand sanitizers are acceptable if hands are not visibly soiled.

      2.4.b Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, then rinsed in freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water).

      2.4.c Food handling and diaper changing areas should be physically separated and cleaned daily.

      2.4.d Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; soiled diapers should be disposed of properly. If available, gloves should be worn when changing diapers. If the child care setting is licensed by Children Youth and Families Department (CYFD), the child care facility is required to maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. However, if this child care facility is not licensed by CYFD, diaper logs are not required by regulation, but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director,
or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

2.4.e Access to shared water play areas should be temporarily suspended during an outbreak.

2.4.f Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

3. Outbreak

3.1 If an outbreak of shigellosis (i.e., two or more cases) is suspected in a child care facility, ERD should be notified immediately. Outbreaks of shigellosis in this situation would ordinarily be controlled by exclusion and treatment of symptomatic children and staff.

Managing Shigellosis Outbreak in School-Age Children

*Shigella* outbreaks in K-12 schools control measures (exclusions of cases, hand washing, and environmental cleaning) are very similar to *Shigella* outbreaks in daycares. However, the ability of children to correctly and consistently wash their hands will vary greatly, especially those in elementary schools. Control measures should be adapted and appropriate to the developmental ability of the child (i.e. a kindergarten student should be managed differently than a high school student).

1. Exclude laboratory confirmed or symptomatic cases (staff or student). Cases may not return to school for 48 hours after symptoms resolve.
   1.1 Laboratory confirmation includes PCR and culture testing.
   1.2 Symptoms for *Shigella* include diarrhea, fever, nausea, and sometimes vomiting, cramps, and toxemia (blood poisoning from toxins produced by the bacteria). Stools often contain blood and mucus. Incubation period varies from 1 to 7 days but is typically 1-3 days.

2. Symptomatic or confirmed cases should also be excluded from afterschool programs. Cases may not return to afterschool programs for 48 hours after symptoms resolve.

3. Identify symptomatic (potential source or secondary) cases in the school.

4. Reinforce and improve hand washing.
   4.1 Students and staff must wash their hands after each visit to the restroom and before eating.
   4.2 If the laboratory-identified case is in a younger grade, hand washing should be supervised.
   4.3 High-touch games (such as face painting and Play-Doh®) should be discontinued until there are no new cases for at least one week.

5. Increase cleaning of high contact surfaces in the affected rooms using EPA-registered disinfectant.

6. Meet with school staff to ensure knowledge of means of transmission and prevention/control measures for shigellosis.
6.1 Ensure that the school has adequate stock of hand washing supplies and appropriate environmental cleaning products.

6.2 Bathrooms should be monitored for cleanliness and cleaning should be increased.

7. Notify community health care providers. Clinicians should be aware of the following:

7.1 There is currently an outbreak in their community

7.2 Appropriate control measures

7.3 Laboratory testing requirements for diagnosis and readmission

7.4 Antibiotics should be given to all symptomatic cases during an outbreak.

7.4.1 Antibiotics help to shortening the duration of shedding thus helping to stop the spread of the outbreak.

7.5 Potential need to adapt choice of antibiotic to susceptibility of the outbreak strain

**Managing Institutional Shigellosis Outbreaks**

Outbreaks in residential institutions with housed adults who situations with housed adults who are unable to care for themselves (e.g., mentally disabled or skilled nursing facility residents) can be difficult to control and control measures are similar to those in other high-risk settings. Recommended control measures are:

1. Use a cohort system (i.e., housing symptomatic residents in same rooms).

2. Emphasize and supervise consistent hand hygiene for residents and staff.

3. Screen staff and other residents for symptoms and follow contact management measures as stated above.

4. Use appropriate antimicrobial therapy until stool cultures are negative for Shigella.

5. Prophylaxis of asymptomatic contacts is not recommended.

6. Keep new admissions separate from symptomatic residents.

If an outbreak of shigellosis (i.e., two or more cases) is suspected in a residential facility, the Epidemiology and Response Division should be notified immediately at 505-827-0006. Epidemiology and Response Division can assist in coordination of all control measures.

**References**


What is shigella?

When your doctor says that you have ‘shigella’, the doctor means that you have an intestinal or stomach infection with bacteria called *Shigella*.

What are the symptoms of shigella infection?

The most common symptoms of *Shigella* infection are diarrhea, abdominal pain, fever, severe cramping and vomiting. The stool (feces) may also contain blood and/or mucus. Most people with shigellosis feel better after a week of illness. The symptoms usually appear within 1 to 3 days after exposure. Some infected persons do not have any symptoms.

How is shigella spread?

*Shigella* is present in stools of infected persons while they are sick and for up to four weeks afterwards. An infected person may “dirty” or contaminate food or water. For example, infected persons can spread *Shigella* by not washing their hands after going to the bathroom and then handling food that other people will eat. Another way to get shigellosis is by direct oral contact with feces from an infected person. This could unintentionally happen while diapering children. *Shigella* infections can also be acquired by drinking or swimming in contaminated water. Water may become contaminated if sewage runs into it, or if someone with *Shigella* infection swims in it.

How long are people contagious?

People infected with shigellosis can spread the bacteria from the moment they begin feeling ill and for up to four weeks afterwards.

Who gets shigellosis?

Anyone can become infected with these bacteria. Because there are many different strains of *Shigella*, shigellosis can re-occur throughout a person’s lifetime.

What treatment is available for people with shigellosis?

Most *Shigella* infections will go away without treatment. However, there are some instances where your health care provider may recommend treatment with antibiotics to make you feel better sooner and shorten the time *Shigella* are present in your stool.

Do infected people need to be kept home from school, work or daycare?

Since the bacteria is found in stool, children should not go to daycare or school while they have diarrhea and food handlers should be excluded from work. Day care attendees and food handlers may return to day care or work after two negative stool culture results.

How can I protect myself and my family from getting shigella?

You can decrease your chance of coming in contact with *Shigella* by the following practices:

- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Promptly disinfect contaminated surfaces with household chlorine bleach-based cleaners.
- Wash soiled clothing and linens.
- Avoid food or water from sources that may be contaminated.
¿Qué es la shigela?
Si su doctor le dice que tiene “shigela” o disentería, lo que quiere decir es que usted tiene una infección en su estómago o intestinos causada por una bacteria que se llama “shigela”.

¿Cuáles son los síntomas de la disentería?
Los síntomas más comunes de la disentería son diarrea, dolor abdominal, fiebre, fuertes retorcijones y vómito. Puede haber sangre o moco en la diarrea (heces). La mayoría de las personas con disentería mejoran después de una semana. Los síntomas normalmente aparecen uno o dos días después de haber estado expuesto a la bacteria. Algunas personas aunque están infectadas no tienen ningún síntoma.

¿Cómo se transmite la bacteria de la shigela?
La shigela se encuentra en las heces de las personas infectadas mientras están enfermas y continua presente durante cuatro semanas. Una persona infectada puede “ensuciar” o contaminar la comida o el agua. Por ejemplo, las personas infectadas pueden transmitir la shigela si no se lavan las manos después de usar el baño y entonces tocan los alimentos que van a comer otras personas. Otra forma de contraer disentería es porque la bacteria pasa directamente de las heces de una persona infectada a la boca. Esto puede ocurrir de forma accidental mientras se cambian los pañales de los niños. La disentería también se puede contraer cuando se bebe o se nada en agua contaminada. El agua puede estar contaminada si tiene parte de aguas negras o si alguien que tiene una infección por shigela nada en ella.

¿Por cuánto tiempo puede alguien con disentería contagiar a otros?
Las personas que están infectadas con disentería pueden transmitir la bacteria desde el momento en que se empiezan a sentir enfermas y continua presente por cuatro semanas.

¿Quién puede contraer la disentería?
Cualquier persona puede contraer una infección causada por esta bacteria. Hay muchos diferentes tipos de shigela, por eso la disentería puede volver a ocurrir en la vida de una persona.

¿Cómo se trata la disentería?
La mayoría de las infecciones por shigela desaparecen sin usar ningún tratamiento. Sin embargo, hay algunos casos en los que su médico le puede recomendar tratamiento con antibióticos para hacerle sentir mejor y reducir el tiempo durante el cual la shigela está presente en sus heces.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
La bacteria se encuentra en las heces, por esto, los niños no deben ir a la guardería o a la escuela mientras tengan diarrea y las personas que trabajan manipulando alimentos no deben ir al trabajo. Los niños pueden regresar a la guardería o a la escuela y los trabajadores que manipulan alimentos pueden regresar a su trabajo cuando hayan tenido dos resultados negativos en sus pruebas de heces.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la disentería?
Para reducir sus posibilidades de tener contacto con la bacteria de la shigela, haga lo siguiente:

- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Desinfecte pronto las superficies contaminadas con un producto limpiador para la casa antibacterial (por ejemplo, que contenga cloro).
- Lave la ropa de cama y otras prendas de vestir que se hayan ensuciado.
- Evite tomar agua o alimentos que puedan provenir de fuentes contaminadas.
Streptococcal Infections (Invasive Group A)

Summary

Invasive disease due to group A streptococcus (GAS) is caused by the bacterium *Streptococcus pyogenes*. These infections can be severe and may be associated with streptococcal toxic shock syndrome (STSS) or necrotizing fasciitis (NF). Severe infections often follow minor or unrecognized trauma. More than 120 distinct serotypes of group A Beta-hemolytic streptococci (*Streptococcus pyogenes*) have been identified based on antigenic differences in M-protein gene sequence (*emm* type). Certain *emm* types have been associated with virulence of the bacteria. Risk factors for invasive GAS include: older age, cancer, heart disease, diabetes mellitus, HIV infection, injection drug use, and recent varicella infection.

Agent

*Streptococcus pyogenes*, group A β-hemolytic streptococci.

Transmission

Reservoir:

Humans are the only reservoir for *S. pyogenes*.

Mode of Transmission:

GAS is spread person to person through direct contact with respiratory secretions of infected or colonized persons, or through direct contact with skin lesions of infected persons. Asymptomatic pharyngeal carriage occurs among all age groups but is most common among children. Invasive disease may result from penetration of GAS through breaks in skin (e.g., bites, burns, traumatic wounds, varicella lesions) or through penetration of intact mucous membranes. The specific portal of entry is unknown in the majority of cases of invasive GAS disease. Subsequent invasive GAS infections among household contacts of index cases of invasive GAS are rare. In the health care setting, colonized (anus, vagina, throat, or skin) healthcare workers may spread GAS to patients.

Period of Communicability:

Communicability of patients with GAS pharyngitis is highest during acute infection, and in untreated people, gradually diminishes over a period of weeks. Patients are no longer contagious within 24 hours after initiation of appropriate antimicrobial therapy. Among persons with asymptomatic pharyngeal carriage of GAS, the risk of transmission to others is believed to be minimal, but carriage may persist for months. Untreated purulent GAS skin lesions may be contagious for weeks or months.

Clinical Disease

Incubation period:

The incubation period for GAS pharyngitis is usually 2-5 days. For impetigo it is believed to be 7-10 days. For invasive GAS disease, the incubation period is variable.

Illness:

Pharyngitis (strep throat) is the most common clinical syndrome resulting from infection with GAS. Skin infections (e.g., impetigo or pyoderma) are also common. Infrequently, however, GAS may become invasive and cause more severe illness. Invasive GAS infections may manifest as any of several clinical syndromes, most commonly including: 1) bacteremia in
association with skin/soft tissue infection, 2) bacteremia alone, 3) pneumonia, 4) necrotizing fasciitis (colloquially referred to as “flesh-eating bacteria”), and 5) streptococcal toxic shock. Meningitis due to GAS has been reported but is rare.

Postpartum invasive GAS:
Isolation of GAS during the postpartum period, from either a sterile site or a wound infection, in association with a clinical postpartum infection (e.g., endometritis). The postpartum period of interest includes all inpatient days and the first seven days after discharge.

Post-surgical invasive GAS:
Isolation of GAS during the hospital stay or during the initial seven days after discharge, from a sterile site or a surgical wound, in a postsurgical patient for whom the indication for surgery was not a preexisting GAS infection.

Laboratory Diagnosis

The diagnosis of GAS (S. pyogenes) is established by isolation from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Treatment

High-dose parenteral antimicrobial therapy is required for invasive GAS infections. Resistance to penicillin or cephalosporins has not been documented. For more severe cases, including toxic shock syndrome, clindamycin and intravenous immune globulin may be used. (Refer to American Academy of Pediatrics. 2018-2021 Red Book: Report of the Committee on Infectious Diseases, 31st Edition. Illinois, Academy of Pediatrics, 2018 for more information). Treatment decisions should be made by the patient’s health care provider.

Surveillance

Case Definition:

Laboratory criteria* - Isolation of GAS (S. pyogenes) from a normally sterile site (e.g., blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Confirmed - A clinically compatible case that is laboratory confirmed.

Probable - A clinically compatible postpartum or postsurgical case in which GAS is isolated from a wound (and not from a normally sterile site), without NF or STSS.

- Please be aware that newly developed polymerase chain reaction (PCR) testing is becoming available and may be adopted in NM laboratories.

Reporting:

Report all suspected, probable or confirmed cases to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

Case Investigation:

Use the Bacterial Meningitis Invasive Respiratory Disease (BMIRD) Form to complete the investigation. Information should also be entered into NM-EDSS per established procedures.

Sporadic cases: Individual cases of invasive GAS do not need to be routinely interviewed.

Postpartum / Postsurgical GAS: Even one case should prompt an epidemiologic investigation by the hospital's infection control personnel in conjunction with the
Epidemiology and Response Division due to the potential for prevention of additional cases if source colonized health care personnel (HCP) can be identified and treated. In response to a single identified case, surveillance in the hospital should be enhanced and GAS isolates saved. Enhanced surveillance should involve review of microbiology records from the previous six months, consultation with obstetricians/surgeons/other providers and review of medical records to identify other possible cases, and encouraging active culturing for all suspected new cases. Current guidelines state that screening of HCP for GAS colonization may be considered for one identified case but is strongly recommended for two or more cases identified within a 6-month period.

**Control Measures**

The most important means of reducing spread of GAS disease is prompt identification and treatment of infections. Appropriate hand hygiene is recommended before and after contact with infected persons.

1. **Case management**
   1.1. Isolation: Children with streptococcal pharyngitis or scarlet fever should be excluded from child care until 24 hours of appropriate antibiotic therapy has been completed.

2. **Contact management**

   **Prophylaxis:**
   
   2.1. Routine chemoprophylaxis is not recommended for household contacts of index patients.
   
   2.2. Health care providers may choose to offer chemoprophylaxis to household contacts who are at increased risk for invasive GAS infection (e.g., aged >65 years of age, HIV infection, diabetes mellitus, varicella) or of subsequent death once infected (age >65 years.)
   
   2.3. Providers who choose to prescribe chemoprophylaxis for a high-risk household contact should prescribe chemoprophylaxis for all household members since clustering of asymptomatic carriage of GAS within households is common.

3. **Prevention**

   3.1. If appropriate, families and close contacts of sporadic cases may be educated about signs and symptoms of GAS infections, about persons at increased risk for invasive GAS, and about varicella vaccination as a means of preventing invasive GAS as a complication of chickenpox.

   3.2. Immunization: Not currently available.

**Management of Streptococcus A in Child Care Centers**

1. One case of invasive GAS in a child care or pre-school setting is not usually a cause for alarm, although it may cause anxiety among staff and parents.

2. Management of isolated cases
   
   2.1. Recommend that all classmates and classroom staff with signs/symptoms of pharyngitis or active skin lesions be cultured for GAS infection by their usual medical provider.
2.2. Exclude symptomatic culture-positive children and staff from the facility until 24 hours after beginning correct antimicrobial therapy.

2.3. Recommend that all children >12 months of age who are susceptible to varicella (i.e., no history of chickenpox and no varicella vaccination) receive varicella vaccination.

2.4. A second case of invasive GAS in the same facility within several months’ time period should be considered a possible outbreak and warrants an epidemiologic investigation and more aggressive disease control measures. Please contact ERD at 505-827-0006 for assistance.

Management of *Streptococcus A* in Long-Term Care Facilities

One case of invasive GAS should prompt enhanced surveillance by the facility for other possible cases of GAS infection. The identification of additional cases may require more rigorous epidemiologic investigation and disease control measures. Please contact ERD at 505-827-0006 for assistance.

References


Tetanus

Summary
Tetanus, or ‘lockjaw’, is caused by a neurotoxin produced by *Clostridium tetani*. Tetanus occurs worldwide but is rare in the U.S. Fewer than 40 cases have been reported annually since 1999. Almost all reported cases of tetanus are in persons who did not have a vaccination history that was up to date (i.e., no booster in the preceding 10 years), had an incomplete vaccination history, or had never been vaccinated at all. Persons who inject heroin are at higher risk for tetanus, particularly if they are diluting the product with quinine, which may support the growth of *C. tetani*. Neonatal tetanus is a common cause of neonatal death in areas where mothers are not immune and where non-sterile umbilical cord-care practices are followed. Neonatal tetanus is common in some developing countries but is rare in the United States.

Agent
*Clostridium tetani*, a gram-positive, motile, spore-forming, obligate anaerobic bacillus. *C. tetani* spores are ubiquitous in the environment, and if deposited in anaerobic conditions, such as a wound, they may germinate and produce toxins.

Transmission
Reservoir:
- Intestines of horses and other animals, including humans, where it does not produce signs/symptoms. Soil can become contaminated by feces. Therefore, tetanus spores are ubiquitous in the environment.

Mode of transmission:
- Contact of a wound in the skin with material containing tetanus spores. Contaminated wounds, deep wounds, or wounds with devitalized tissue are at greatest risk.

Period of communicability:
- Not communicable from person to person.

Clinical Disease
Incubation period:
- Most cases occur within 8-10 days; ranging from 3 to 21 days. In neonatal tetanus, symptoms usually appear from 4-14 days after birth, averaging about seven days.

Illness:
- The wound that harbors *C. tetani* may not be apparent and is frequently minor. Evidence of frank wound infection is likely to represent infection by other bacteria. Deep or puncture wounds, crush injuries, and burns are at higher risk for tetanus infection because anaerobic conditions and devitalized tissue are present. Localized tetanus consists of painful tonic muscle spasms in the area of a wound. Cephalic tetanus is cranial nerve dysfunction (especially affecting eye and oropharyngeal muscles) associated with wounds of the head and neck. Either form of localized tetanus can precede generalized tetanus. Older children and adults may first experience abdominal muscle spasm. Muscle spasms often produce trismus (inability to open the mouth fully or at all). Spasms of the neck and back cause stiffness which can progress to opisthotonos (a condition of abnormal posturing that
involves rigidity and severe arching of the back, with the head thrown backward.)
Tetanospasms are seizure-like episodes of severely painful rigidity of the neck, trunk and extremities often with laryngeal and glottic spasm. Episodes of spasm may be precipitated by minor sensory stimuli; dysphagia may result in hydrophobia; urinary retention may occur. Laryngeal spasm may cause sudden death.

**Laboratory Diagnosis**

Culturing of the wound may be done but the yield is often poor (30% recovery rate) and tetanus can be isolated from persons who do not have tetanus. Therefore, treatment should not be based on laboratory evidence.

The diagnosis should be made based on clinical presentation and exclusion of other possibilities, such as hypocalcemia, strychnine poisoning, phenothiazine reaction, and hysteria.

**Treatment**

Tetanus is a medical emergency requiring hospitalization. All wounds should be properly cleaned and debrided. Tetanus immune globulin (TIG) is recommended for treatment. TIG does not preclude a booster vaccination if needed. Booster vaccine is recommended if needed (see Prevention section below). As appropriate antibiotic treatment (usually metronidazole or penicillin) be provided. Supportive care and pharmacotherapy to control spasms also may be necessary.

Patients should be immunized against tetanus during convalescence from tetanus

**Surveillance**

Case Definition:

- **Clinical definition**- acute illness with muscle spasms or hypertonia.
- **Confirmed** - There is no definition for “confirmed” tetanus.
- **Probable** - In the absence of a more likely diagnosis, an acute illness with muscle spasms or hypertonia, AND diagnosis of tetanus by a health care provider; OR death, with tetanus listed on the death certificate as the cause of death or a significant condition contributing to death

**Reporting:**

Report all suspected or confirmed cases of tetanus to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, health care provider, and vaccination history if available.

**Case Investigation:**

Complete the CDC Tetanus Surveillance Worksheet and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

1. Case management
   1.1. Isolation: None required.
1.2. Prophylaxis: Not applicable.

2. Contact management
   2.1. Isolation: None required.
   2.2. Prophylaxis: Not applicable.

3. Prevention
   3.1. Immunization: Active immunization with tetanus toxoid is indicated routinely for all children at 2, 4, 6, and 15-18 months of age, with a booster at 4-6 years of age. The preferred vaccine is DTaP (combined with diphtheria toxoid and acellular pertussis). If there is a contraindication to pertussis vaccination DT vaccine should be used. Active protection should be maintained by administration of Td or Tdap (tetanus toxoid combined with diphtheria toxoid and acellular pertussis) vaccine every 10 years. Additional Tdap information may be found in the Pertussis chapter.

   3.2. Wound management should include cleaning and thorough debridement of all wounds.

   3.3. Immunization status should be assessed, and intervention as follows:
      
      3.3.a If the person has had fewer than three doses of tetanus toxoid vaccine or an uncertain history of tetanus immunization AND the wound is clean and minor, one dose of appropriate vaccine is given on the day of injury and additional doses at 4-8 week intervals to complete the primary series. If the wound is contaminated or extensive, TIG should also be given. The dose of TIG should be given intramuscularly; separate syringes and sites should be used when TIG and tetanus vaccine are given concurrently.

      3.3.b If the person has had at least three doses of tetanus toxoid vaccine, but the last dose was more than five years previously, a booster dose should be given if the wound is contaminated or extensive. If the wound is clean and minor, a booster dose of vaccine is needed only if the last dose was given more than 10 years previously. TIG is not indicated in these circumstances.

**Tetanus Wound Management**

<table>
<thead>
<tr>
<th>Vaccination History</th>
<th>Clean, minor wounds</th>
<th>All other wounds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Td*</td>
<td>TIG</td>
</tr>
<tr>
<td>Unknown or less than 3 doses</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3 or more doses</td>
<td>No+</td>
<td>No</td>
</tr>
</tbody>
</table>

* Tdap may be substituted for Td if the person has not previously received Tdap and is 10 years or older
+ Yes, if more than 10 years since last dose
** Yes, if more than 5 years since last dose

3.3.c Determining appropriate vaccine: For persons aged younger than 6 years who require tetanus toxoid vaccination, DTaP vaccine (combined with diphtheria
toxoid and acellular pertussis) should be used unless there is a contraindication to pertussis vaccination. In this situation, DT vaccine (combined with higher dose diphtheria toxoid) should be used. For persons aged 7-10 years who require tetanus toxoid vaccination for wound prophylaxis, DT vaccine (combined with diphtheria toxoid) should be used. For persons aged 11-64 years, Tdap vaccine (tetanus toxoid combined with diphtheria toxoid and acellular pertussis) should be used unless there is a contraindication to pertussis vaccination, in which caseTd vaccine should be used.

Managing Tetanus in Child Care Centers

All children should be immunized against tetanus.

References


What is tetanus?
Tetanus, commonly called lockjaw, is a bacterial disease that affects the nervous system. This disease is rare in the United States.

What are the symptoms of tetanus?
Symptoms may appear in 3 to 21 days following exposure, but usually appear 8-10 days after exposure. The first sign of tetanus is usually muscular stiffness in the jaw (lockjaw). This may be followed by stiffness of the neck, difficulty swallowing, rigidity of abdominal muscles and spasms.

How is tetanus spread?
The tetanus bacteria live throughout the environment and are commonly found in soil “dirtied” or contaminated with manure. The tetanus bacteria enter the body through a wound. It is not spread from person to person.

How long are people contagious?
Persons with tetanus are not contagious; it is not spread from person to person.

Who gets tetanus?
Persons who are not up to date on vaccines are the most likely to get the disease. Tetanus occurs more often in older people who have not received adequate booster doses of vaccine. Farm or dairy workers, who have contact with manure, are also at a higher risk of getting tetanus.

What treatment is available for people with tetanus?
Clean wounds promptly and thoroughly. Dead tissue should be removed by health care personnel. If the patient has not had a tetanus toxoid booster in the previous 10 years, a single booster injection should be administered on the day of injury. For severe wounds, a booster may be given if the patient has not been previously immunized with a series of at least three doses of toxoid. In some cases, tetanus immunoglobulin may be needed.

Do infected people need to be kept home from school, work or daycare?
No. Persons may go to school, work or daycare. The wound should be kept well covered.

How can I protect myself and my family from getting tetanus?
- Keep up to date on immunizations. Diphtheria toxoid is usually combined with tetanus toxoid and pertussis vaccine to form a triple vaccine known as DTaP. This vaccine should be given at 2, 4, 6 and 15 months of age, and between 4 and 6 years of age. Everyone should also receive a combination of tetanus toxoid and diphtheria toxoid (Td) or tetanus toxoid, diphtheria toxoid and acellular pertussis (DTaP) every 10 years to maintain immunity.
- Clean wounds immediately after they occur and keep clean until completely healed.
¿Qué es el tétanos?
El tétanos es una enfermedad que afecta al sistema nervioso y está causada por una bacteria. A veces también se llama trismo. Esta enfermedad es rara en los Estados Unidos.

¿Cuáles son los síntomas del tétanos?
Los síntomas pueden aparecer de 3-21 días después de estar expuesto, pero normalmente aparecen de 8-10 días después de estar expuesto. La primera señal del tétanos es rigidez y cierre de la mandíbula (trismo). A esto le puede seguir rigidez en el cuello, dificultad al tragar, rigidez de los músculos abdominales y contracciones musculares violentas.

¿Cómo se transmite el tétanos?
La bacteria que causa el tétanos vive en nuestro entorno y normalmente se encuentra en el suelo que está ensuciado o contaminado con estiércol orgánico (que proviene de animales). El contacto con la bacteria se produce a través de heridas abiertas. No se transmite de persona a persona.

¿Por cuánto tiempo puede alguien con tétanos contagiar a otros?
Las personas que tienen tétanos no son contagiosas, esta enfermedad no se transmite de persona a persona.

¿Quién puede contraer el tétanos?
Es más posible que las personas que no tienen sus vacunas al día puedan contraer la enfermedad. El tétanos es más frecuente en personas mayores que no han recibido un refuerzo adecuado de la vacuna. Las personas que trabajan en granjas, que tienen contacto con el ganado o con el estiércol tienen un mayor riesgo de contraer la enfermedad.

¿Cómo se trata el tétanos?
Limpie las heridas inmediatamente y a fondo. El tejido muerto deberá ser removida por personal médico. Si el paciente no ha recibido una dosis de refuerzo de la vacuna en los últimos diez años, se debe administrar una inyección con este refuerzo el mismo día en que se hirió. En caso de heridas graves, se debe administrar el refuerzo si el paciente no ha recibido previamente al menos una serie de tres dosis de la vacuna. En algunos casos la inmunoglobulina de tétanos puede ser requerida.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas pueden ir a la escuela, a la guardería o al trabajo. La herida debe mantenerse bien cubierta.

¿Cómo puedo protegerme yo y también proteger a mi familia contra el tétanos?
- Vacúnese y mantenga al día sus vacunas. Normalmente la vacuna de la difteria se combina con el tétanos y la tos ferina, forman una única vacuna que se conoce como triple viral (DTaP por sus siglas en inglés). Esta vacuna se debe administrar a la edad de 2, 4, 6 y 15 meses, y después entre los 4 y 6 años. También todos deben recibir una vacuna de refuerzo combinada contra el tétanos y la difteria (Td) o contra el tétanos, difteria y tos ferina acelular (TDaP, por sus siglas in inglés) cada 10 años para mantener la inmunidad.
- Limpie las heridas inmediatamente cuando ocurran y manténgalas limpias hasta que se hayan curado por completo.
Tularemia

Summary
Tularemia, also known as rabbit fever, is a zoonotic disease caused by the bacterium *Francisella tularensis*. Tularemia is found throughout the northern hemisphere. The primary reservoir hosts are rabbits, hares, and rodents. Ticks serve as both reservoirs and vectors of tularemia. Typically, humans become infected through tick or deerfly bites or by handling infected animals. Less commonly, infection may be acquired by direct contact or ingestion of contaminated water, food or soil, inhaling airborne bacteria, or from animal bites. Dogs and cats are also susceptible to tularemia and typically become infected through ingestion of infected rodents or rabbits.

The most common clinical presentation is the ulceroglandular form as a skin ulcer or eschar at the site of inoculation of the organism together with swelling of the regional lymph nodes. Other presentations include glandular (lymphadenitis with no apparent primary ulcer), oropharyngeal (from ingestion of contaminated food or water), primary pneumonic (inhalation of infectious material), oculoglandular (conjunctivitis and lymphadenitis after inoculation of the conjunctival sac), and typhoidal with no localizing signs. All forms of tularemia can progress to secondary pneumonia, meningitis, or sepsis. Tularemia has not been shown to spread from person to person. Tularemia is treatable with antibiotics but has been fatal with inadequate or delayed treatment in less than 4% of cases. Tularemia preventive measures include: avoidance of tick and deer fly bites, use of impervious gloves when skinning or handling rabbits or rodents, cooking rabbit or rodent meat thoroughly; using tick control products on pets, and preventing pets from hunting.

Agent
Tularemia is caused by *Francisella tularensis*, a small, non-motile, gram-negative coccobacillus.

Transmission
Reservoir:

Wild rodents and lagomorphs (rabbits and hares) are the natural vertebrate reservoirs of tularemia. Hard ticks (*Ixodidae*) can also serve as a reservoir, while deer fly bites, contaminated water or soil, and infected domestic cats may also be a source of infection to humans.

Vector:

In New Mexico, hard ticks and deer flies are the most important vectors of tularemia to humans. In Europe, there has been demonstrated transmission from mosquitoes.

Mode of Transmission:

Most humans acquire tularemia through handling infected rabbits or rodents, or from deer fly or tick bites. Tularemia may also be transmitted by: 1) direct contact with tissues and fluids of infected rodents and rabbits; 2) bites or scratches from an infected domestic cat; 3) inhalation of the organism from contaminated soil, grain, hay or aerosolized infected animal carcasses; 4) ingestion of contaminated water or undercooked meat from an infected animal; and 5) rarely the mishandling of tularemia cultures by laboratory workers.
Period of Communicability:

No direct person-to-person transmission has been reported. Infected cats or dogs may have draining lesions or saliva that should be considered infectious until 48 hours of appropriate antimicrobial therapy has been given and there is evidence of clinical improvement (including defervescence). The infectious agent may be found in the blood of untreated patients during the first two weeks of disease and in lesions for a month or more. Flies can be infective for 14 days and ticks throughout their lifetime (about two years). Frozen rabbit meat has remained infective for years. Tularemia organisms have been shown to survive for weeks at low temperatures in water, moist soil, hay, straw, and decaying animal carcasses.

Clinical Disease

Incubation period:

Related to size of inoculum, usually 3-5 days with a range of 1-21 days.

Illness:

The common symptoms of tularemia include sudden onset of high fever, chills, fatigue, general body aches, headache, and nausea. Tularemia can infect humans through the skin, mucous membranes, GI tract, and the lungs. Specific clinical presentations of tularemia include:

- Ulceroglandular: This is the most common form of tularemia, as a skin ulcer or eschar at the site of inoculation of the organism together with swelling of the regional lymph nodes.
- Glandular: Lymphadenitis with no apparent primary ulcer.
- Oropharyngeal: A painful pharyngitis can develop from ingestion of contaminated food or water, along with abdominal pain, diarrhea and vomiting.
- Oculoglandular: Follows direct contamination of the eye with ulceration of the conjunctiva, chemosis, vasculitis, and regional lymphadenitis.
- Pneumonic: Tularemia pneumonia can be the direct result of inhaling contaminated aerosols or be secondary to hematogenous spread from a distal site. Bronchiolitis, pleuropneumonitis, and hilar lymphadenitis accompanied by systemic illness may be present.
- Typhoidal: Systemic infection manifested as fever and other constitutional signs/symptom without cutaneous or mucosal membrane lesions or regional lymphadenitis.

Tularemia cannot be distinguished clinically from plague or many other gram-negative infections and should be considered in any patient who presents with fever and acute lymphadenitis and resides in a known tularemia area. Recent laboratory confirmed human cases in New Mexico have occurred in Bernalillo, Santa Fe, Rio Arriba, and San Juan counties while laboratory confirmed animal cases have occurred in San Juan, Torrance, Rio Arriba, Bernalillo, Santa Fe, Los Alamos, and San Miguel counties.

Laboratory Diagnosis

A single positive serologic test result (≥1:128 for total antibody) by passive hemagglutination assay or enzyme immunoassay in an unimmunized patient who has not previously had tularemia provides presumptive evidence of infection. A 4-fold rise in total antibody titer
between two serum specimens obtained two or more weeks apart provides serologic confirmation.

Diagnosis of tularemia, preferably, is confirmed by culture of *F. tularensis* from blood, skin lesion, lymph node aspirate, or other clinical specimens. Samples should be submitted to the New Mexico Department of Health Scientific Laboratory Division (SLD) for microbiological confirmation. At SLD, contact the General Microbiology section (505-383-9127) or the Virology section (505-383-9124) for questions about specimen submission.

**Treatment**

Prompt diagnosis and treatment are critical for preventing tularemia from progressing to more serious clinical forms. When human tularemia is suspected on clinical and epidemiological grounds, appropriate specimens for diagnosis should be obtained immediately, and the patient should be started on specific antimicrobial therapy pending laboratory confirmation.

Treatment of disease: Streptomycin is considered the antibiotic of choice with gentamicin an acceptable alternative that is more widely available. Tetracyclines, chloramphenicol, and ciprofloxacin have also been shown to be effective. Treatment with aminoglycosides and ciprofloxacin should be continued for 10 days while treatment with bacteriostatic agents should be continued for 14-21 days to reduce chance of relapse.

It is important for physicians with suspected cases to consult with an infectious disease specialist.

Prophylactic therapy: Post-exposure prophylactic antibiotic treatment of close contacts of tularemia patients is not recommended since human-to-human transmission of *F. tularensis* is not known to occur. Persons exposed to a known case of tularemia in an animal (skinning an infected dead rabbit or rodent, scratch or bite from an infected cat) should consider antibiotic prophylaxis. A 14-day course of doxycycline or ciprofloxacin is recommended. If exposure is less certain, then a fever watch is recommended. Contacts should be instructed to measure their temperature twice a day for 14 days and see a physician immediately if fever greater than 100° F develops. Laboratory cultures of *F. tularensis* are easily aerosolized and antibiotic prophylaxis may be indicated if cultures were not kept under a hood while open. Contact the Epidemiology and Response Division at 505-827-0006 regarding specific recommendations for tularemia prophylaxis.

**Surveillance**

**Case Definition:**

*Clinical diagnosis* is supported by evidence or history of a tick or deerfly bite, exposure to tissues of a mammalian host of *Francisella tularensis*, or exposure to potentially contaminated water.

*Confirmed* – a clinically compatible case with confirmatory laboratory results (isolation of *F. tularensis* from a clinical specimen; four-fold or greater change in serum antibody titer to *F. tularensis* antigen).

*Presumptive* – a clinically compatible case with presumptive laboratory results: Elevated serum antibody titer(s) to *F. tularensis* antigen (without documented fourfold or greater change) in a patient with no history of tularemia vaccination or detection of *F. tularensis* in a clinical specimen by direct fluorescent assay (DFA).

**Reporting:**
Report all suspected or confirmed cases of tularemia to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider. The Epidemiology and Response Division will complete a tularemia case report form.

Case Investigation:

Complete the CDC Tularemia Surveillance Report form and mail to the Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered in NM-EDSS per established procedures.

**Control Measures**

1. **Case management**
   
   1.1. Isolation: Not recommended for tularemia patients given the lack of human-to-human transmission. In hospital settings, standard precautions are recommended. If plague has not yet been ruled out of the diagnosis then droplet isolation should be continued until 48 hours of appropriate antimicrobial therapy has been given and there has been a favorable clinical response (e.g., defervescence).

2. **Contact management**
   
   2.1. Isolation: None required.
   
   2.2. Prophylaxis (see Treatment section also):
   
   2.1.a Asymptomatic persons having direct exposure to infectious materials from sick or dead animals with tularemia or ingestion or inhalation of known tularemia infected material should receive post-exposure antibiotic prophylaxis for 14 days.
   
   2.1.b Contacts who have not had direct exposure to infectious material should measure their temperature twice a day for 14 days and see a physician immediately if fever greater than 100° F develops.
   
   2.1.c Laboratory workers in hospitals or other settings exposed to a potentially aerosolized tularemia culture may also need post-exposure prophylaxis. Consult with the Epidemiology and Response Division for further recommendations.

3. **Prevention**

   3.1. Immunization: A vaccine for tularemia has been developed but is not yet available to the general public.

   3.2. Surveillance of rabbits and rodents: The Department of Health Zoonoses team submits rodent and rabbit carcasses for routine plague surveillance. These carcasses will occasionally test positive for tularemia. Report rabbit and rodent die-offs to the Epidemiology and Response Division at 505-827-0006. Within Bernalillo County, report rabbit and rodent die-offs to the Albuquerque Environmental Health Department’s Urban Biology Division, 505-452-5300.

   3.3. Control of rabbits, rodents and vectors: Sylvatic (wildlife) tularemia defies most control measures because the wild rabbit and rodent reservoirs are so widespread and diverse as are the vectors (both ticks and deer flies).

   3.4. Public education: Educate the public about risk factors, preventive measures, and signs and symptoms of tularemia.
3.4.a Control ticks on pets and prevent pets from roaming.
3.4.b Avoid contact with dead and sick animals, and potentially contaminated water.
3.4.c Reduce rodent harborage around the home, such as junk piles and abandoned vehicles.
3.4.d Rodent proof houses and outbuildings.
3.4.e Wear rubber gloves when handling wild game and thoroughly cook wild game meat.
3.4.f Keep cats indoors or hunting cats exclusively outdoors. Immediately take to the veterinarian any pet (especially a cat but also a dog) that hunts and has signs of fever and lethargy.

References


What is tularemia?

Francisella tularensis, the bacterium that causes tularemia, is found in the environment, in wild animals (e.g., rabbits), in arthropods (e.g., ticks and deer flies), and in soil and water “dirtied” or contaminated by infected animals. Tularemia is a bacterial disease that can cause a variety of symptoms, depending on how the bacteria enter the body.

What are the symptoms of tularemia?

Symptoms usually appear 3 to 5 days after exposure, with a range of 1 to 21 days. Initial symptoms may include sudden onset of fever, chills, headache, dry cough, muscle aches, joint pain and weakness. How the bacteria get into a person to infect him/her impacts what other symptoms that person might develop. Tularemia may cause skin ulcers, swollen and painful lymph glands, inflamed eyes, sore throat, oral ulcers or pneumonia-like illness. Pneumonia may be a serious side effect of all types of infection and requires quick diagnosis and specific treatment to prevent death.

How is tularemia spread?

The disease may be spread in several ways. Hunters may be exposed to the bacteria while skinning or dressing wild animals, especially rabbits or hares. A person could also become infected if s/he handled pelts or ate uncooked meat from infected animals. Certain infected arthropods (e.g., ticks and deer flies) may also spread the bacteria when they bite. It is also possible to become infected after drinking contaminated water. Breathing in infected aerosols, such as dust from contaminated soil, hay or grain, is a rarer way tularemia could be spread.

How long are people contagious?

People are not contagious; a person with tularemia cannot spread it to another person.

Who gets tularemia?

Any person can get tularemia. This includes people from all parts of New Mexico.

What treatment is available for people with tularemia?

Early treatment with antibiotics is recommended.

Do infected people need to be kept home from school, work or daycare?

No. Persons with tularemia cannot spread it to other people.

How can I protect myself and my family from getting tularemia?

- Take steps to avoid being bitten by insects such as ticks and deer flies (arthropods). Wear insect repellent and long sleeves and pants while outside in areas where there are lots of bugs.
- Teach children not to touch wild rabbits or other potentially infected animals.
- Wear rubber gloves when skinning or handling animals, especially rabbits. Wash your hands after.
- Cook the meat of wild rabbits and rodents thoroughly before eating it.

What about my pet?

Your pet may also get tularemia in similar ways as humans. Immediately take your pet to the veterinarian if it develops signs of fever, tiredness and loss of appetite, especially after hunting. Pets with tularemia are not likely to spread it to their owners.
¿Qué es la tularemia?
La bacteria que causa la tularemia se llama *Francisella tularensis*. Se encuentra de forma natural en los animales salvajes (como los conejos) y en los insectos (como las garrapatas y tábanos), y también en el agua o suelo contaminados por animales infectados. La tularemia es una enfermedad que puede tener una gran variedad de síntomas, depende de cómo entre el germen en el cuerpo.

¿Cuáles son los síntomas de la tularemia?
Los síntomas suelen aparecer entre 3 y 5 días después de haber estado expuesto, pero también pueden aparecer entre 1 y 21 días después. Los primeros síntomas incluyen una aparición repentina de fiebre, escalofríos, dolor de cabeza, tos seca, dolores musculares, dolor en las articulaciones y debilidad. Otros síntomas van a depender de cómo entró la persona en contacto con la bacteria. Estos síntomas pueden incluir úlceras en la piel o en la boca, dolor e inflamación de los ganglios linfáticos, inflamación de los ojos, dolor de garganta o síntomas similares a la neumonía. La neumonía puede ser un efecto secundario grave de cualquier tipo de infección y requiere un diagnóstico rápido y tratamiento específico para prevenir la muerte.

¿Cómo se transmite la tularemia?
Esta enfermedad se puede transmitir de varias formas. Los cazadores pueden estar expuestos a la bacteria cuando están manipulando animales salvajes, en especial conejos o liebres. También una persona puede contraer la infección si manipula las pieles o come carne cruda de los animales infectados. Algunos insectos infectados (como las garrapatas o los tábanos) también pueden transmitir la bacteria con sus picaduras. Es posible contraer la infección si se bebe agua contaminada. Otra forma de transmisión, aunque muy poco común, es si se respira la bacteria (por inhalación de aerosoles infecciosos), por ejemplo, al respirar el polvo del suelo contaminado, del heno o del cereal en grano.

¿Por cuánto tiempo puede alguien con tularemia contagiar a otros?
Las personas no son contagiosas. Una persona que tiene tularemia no puede transmitirla a otra persona.

¿Quién puede contraer la tularemia?
Cualquier persona puede contraerla. Esto incluye personas de todas partes de Nuevo México.

¿Cómo se trata la tularemia?
Se recomienda el tratamiento temprano con antibióticos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
No. Las personas con tularemia no pueden transmitirla a otras personas.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la tularemia?
- Tome medidas para que no le piquen los insectos. Póngase repelente de insectos, pantalones largos y ropa de manga larga mientras esté al aire libre en lugares donde haya muchos bichos.
- Enséñele a los niños a no tocar a los conejos salvajes u otros animales que puedan estar infectados.
- Póngase guantes de goma cuando esté manipulando animales, especialmente conejos. Lávese las manos después.
- Asegúrese de cocinar bien la carne de conejos y roedores salvajes antes de comerla.

¿Y las mascotas?
Su mascota también puede contraer tularemia de forma muy similar. Llévela inmediatamente al veterinario si tiene señas de fiebre, cansancio y pérdida de apetito, especialmente después de cazar. No es probable que las mascotas que tienen tularemia la transmitan a sus dueños.
Typhoid and Paratyphoid Fevers
(*Salmonella typhi, paratyphi A* and *paratyphi B*)

**Summary**

*Salmonella typhi*, *Salmonella paratyphi A*, and *Salmonella paratyphi B* cause protracted bacteremic illnesses referred to collectively as enteric fevers or individually as typhoid fever or paratyphoid fever. Since humans are the only reservoir for these three species of *Salmonella*, infection is most often acquired through ingestion of food or water contaminated by feces and urine of infected persons and chronic carriers. Both typhoid and paratyphoid fever are characterized by the gradual onset of fever, headache, malaise, anorexia, abdominal pain, hepatosplenomegaly, rose spots, and changes in mental status. Laboratory diagnosis can be made by culture of stool, urine, or blood. Antimicrobial therapy is indicated for patients with both typhoid fever and paratyphoid fever. Enteric fever cases should be excluded from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. An individual may return to normal duties after 3 consecutive negative stool or urine cultures obtained at least 24 hours apart, at least 48 hours after completion of antibiotic therapy, and no earlier than one month after symptom onset.

**Agent**

These enteric fevers are caused by different serotypes of *Salmonella*: *Typhi*, *Paratyphi A* and *Paratyphi B*, which are gram-negative bacilli.

**Transmission**

**Reservoir:**

Humans are the primary reservoir for *S. typhi*, *S. paratyphi A*, and *S. paratyphi B*

**Mode of Transmission:**

Infection is acquired through ingestion of food or water contaminated by feces and urine of infected persons and chronic carriers (most often due to chronic infection of gall bladder). In some circumstances, other vehicles of transmission include ingestion of shellfish taken from sewage-contaminated beds, unwashed raw fruits or vegetables fertilized by night soil, or milk contaminated by carriers. Most U.S. cases are infected during international travel.

**Period of Communicability:**

The period of communicability is as long as the organism appears in excreta (i.e., stool or urine), ranging from the first week of illness throughout convalescence. About 10% of untreated patients will excrete the organism for three months after the onset of signs and symptoms, and 2% to 5% become permanent gallbladder carriers. A chronic carrier state is most common in persons infected during middle age or in persons with underlying biliary tract abnormalities such as gallstones.

**Clinical Disease**

**Incubation period:**

Usually 7-14 days, with a range of 3-60 days.

**Illness:**
Enteric fevers are characterized by the gradual onset of fever, headache, malaise, anorexia, abdominal pain, and changes in mental status. Constipation may be an early feature. Physical exam may show hepatosplenomegaly or rose spots on the trunk. Sustained or intermittent bacteremia can occur.

**Laboratory Diagnosis**

Since *S. typhi* may be absent from stool and urine, in addition to the stool and urine, culture specimens should be obtained from blood, bone marrow or bile (collected from a bile-stained duodenal string) for culture and identification. Serologic tests (e.g., Widal test) are not recommended.

**Treatment**

Antimicrobial therapy for 10-14 days is indicated for patients with typhoid or paratyphoid fever. Appropriate antimicrobial therapy includes ampicillin, cefotaxime, chloramphenicol, trimethoprim-sulfamethoxazole (TMP-SMX), or a fluoroquinolone, depending on the susceptibility of the organism. Relapse is common after completion of therapy. Retreatment may be indicated. The chronic carrier state may be eliminated by 4 weeks of oral therapy with antimicrobial agents that are highly concentrated in the bile. Treatment decisions should be made in conjunction with the patient’s health care provider.

**Surveillance**

**Case Definition**:

*Laboratory criteria* – Isolation of *S. typhi*, *S. paratyphi A*, or *S. paratyphi B* from a clinical specimen.

*Confirmed* – A clinically compatible case that is laboratory confirmed.

*Probable* – A clinically compatible case that is epidemiologically linked to a confirmed case in an outbreak.

**Reporting**:

Report all suspected or confirmed cases of any of the three typhoid fevers immediately to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient’s name, age, sex, race, ethnicity, home address, home phone number, occupation, and health care provider.

**Case Investigation**:

Complete the Foodborne Surveillance Investigation Form and the CDC Typhoid Fever Investigation Form. Send the later to Epidemiology and Response Division, P.O. Box 26110, Santa Fe, New Mexico 87502-6110, or fax to 505-827-0013. Investigation information should also be entered into NM-EDSS per established procedures.

**Control Measures**

1. **Case management**

   1.1. **Isolation**: Exclude symptomatic persons and asymptomatic chronic carriers from food handling, and from direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients. The person may be allowed to resume his/her usual duties when:
   
   - 3 months has passed since report of disease; or
   - Diarrhea has resolved; and
• There are three consecutive negative stool or urine cultures taken at least 24 hours apart and at least 48 hours after completion of antibiotic therapy. The first culture should be taken no earlier than one month after symptom onset. If any culture is positive, repeat cultures at intervals of one month during the 12 months following onset until at least three consecutive negative cultures are obtained, or the patient has medical documentation from a health practitioner that states the food employee or care giver is free from \textit{S. typhi}.

1.1.a For hospitalized patients, contact precautions should be used.

1.2. Prophylaxis: Not applicable.

2. Contact management

2.1. Isolation: Household or close contacts who are involved in food handling or direct care of infants, elderly, immunocompromised, and hospitalized or institutionalized patients should be excluded from their duties until at least two negative stool or urine cultures, taken at least 24 hours apart, are obtained. Prophylaxis is not applicable in this case.

2.2. If the index case traveled oversees, all oversees travel companions of the index case should submit stools samples. Travel companions with positive stools should be treated with antibiotics such as ciprofloxacin and monitored for development of symptoms.

2.3. Asymptomatic contacts of domestic travel do not require stool or urine culture.

3. Prevention

3.1. With a known carrier, household members should, practice meticulous hand hygiene. (i.e., proper hand washing after using the toilet, changing diapers, and before and after handling food).

3.2. Exclude contacts that handle food from highly susceptible populations.

3.3. International travelers should avoid prolonged exposure to potentially contaminated food and water in endemic areas (e.g. Indian subcontinent, Asia, Latin America, Middle East and Africa).

3.4. Immunization: Vaccination against typhoid is available but recommended only for a) travelers to typhoid-endemic areas such as Latin America, Asia and Africa; b) persons with prolonged intimate exposure to a typhoid or paratyphoid carrier; c) laboratory workers with frequent contact with \textit{S. typhi}; d) persons living in typhoid-endemic areas outside the U.S.

**Managing Enteric (Typhoid and Paratyphoid) Fever in Child Care Centers**

1. Management of isolated cases

1.1. When a case of enteric fever occurs among a child care center attendee or staff member, call the Epidemiology and Response Division (ERD) for consultation. Stool specimens from other attendees and staff members should be cultured. All infected persons should be excluded until there are three consecutive negative stool cultures taken at least one month apart, and at least 48 hours after completion of antibiotic therapy. The first culture should be taken no earlier than one month after symptom onset. If any culture is positive, repeat cultures at intervals of one month during the 12 months following onset until at least three consecutive negative cultures are obtained. Antimicrobial treatment should be administered to infected persons.
1.2. The child care center should review its infection control protocols with staff, and emphasize the following:

1.2.a Standard precautions should be followed. Strict hand hygiene routines for staff and children, and routines for handling fecally contaminated materials.

1.2.b Frequently mouthed objects should be cleaned and sanitized daily. Items should be washed with dishwashing detergent and water, then rinsed in freshly prepared (daily) household bleach solution (dilute one cup bleach in nine cups of water).

1.2.c Food-handling and diaper-changing areas should be physically separated and cleaned daily.

1.2.d Diaper changing surfaces should be nonporous and cleaned with a freshly prepared (daily) household bleach solution (dilute 1 cup bleach in 9 cups of water). Cleaning of diaper changing surfaces after each use is required; diapers should be disposed of properly. If available, nonporous gloves should be worn when changing diapers.

1.2.e Ideally institute and maintain a system of stool monitoring (i.e., diaper logs) for all infants and children who are not toilet trained. Diaper logs are not required by regulation but are recommended whenever a day care attendee is diagnosed with an enteric pathogen. At a minimum, diaper logs should document the quality (e.g., formed, loose, watery, blood present, mucus present) and time of each diaper change. The log should be reviewed each day with the center director, or their designated personnel, and personnel from NMDOH who are being consulted and/or investigating individual cases, clusters, or outbreaks at the center. The purpose of the log is to assist in the identification of potential new cases, to prioritize testing recommendations, and assist in determining if exclusion of the infant or child is necessary until infection can be ruled out.

1.2.f Animals in the child care center with diarrhea should be isolated from children and taken to a veterinarian for diagnosis and treatment.

2. Outbreak

2.1. Outbreaks of *S. typhi* infection in child care centers are uncommon. If an outbreak of typhoid or paratyphoid fever (i.e., two or more cases) is suspected in a child care facility, ERD should be notified immediately at 505-827-0006.

References


What is Typhoid Fever?
Typhoid Fever (and Paratyphoid fever) is caused by Salmonella Typhi, Paratyphi A or Paratyphi B bacteria, typically found in feces or urine.

What are the symptoms of a Typhoid Fever infection?
The most common symptoms are gradual onset fever, headache, malaise, abdominal pain, changes in mental status, and constipation. Rose spots on the trunk may be present.

How is Typhoid Fever spread?
Salmonella bacteria may be spread by eating feces or urine contaminated or “dirty” water or food. Infected persons can spread the bacteria by not washing their hands after going to the bathroom and then handling food. Other exposures are consuming shellfish from sewage beds or produce grown in night soil.

How long are people contagious?
Most persons carry the bacteria for 12 weeks after illness. A small percentage of infected persons can become permanent gallbladder carriers.

Who gets Typhoid Fever?
Anyone can get Typhoid Fever, but it is recognized more often in children under 4 years.

What treatment is available for people with Typhoid Fever?
Most Salmonella infections will go away without treatment. Persons with diarrhea should drink plenty of fluids. However, for invasive infections, your health care provider may recommend treatment with antibiotics.

Do infected people need to be kept home from school, work or daycare?
Since the bacteria is found in stool, children should not go to daycare or school and food handlers should be excluded until they have 3 negative stools samples taken 1 month apart or 3 months have passed since notification of disease.

How can I protect myself and my family from getting Typhoid Fever?
- Wash hands frequently with water and soap, and especially after using the toilet, changing a diaper or before preparing and/or eating food. (Sanitizing gel may be substituted when hands are not visibly soiled.)
- Avoid food or water from sources that may be contaminated.
- Wash raw fruits and vegetables prior to eating or chopping.
- Refrigerate foods promptly; minimize time kept at room temperature.
- Immediately washing cutting boards and counters used for preparation to prevent cross contamination with other foods.
- Ensure that the correct internal cooking temperature is reached, particularly when cooking in a microwave.
¿Qué es la fiebre tifoidea?
La fiebre tifoidea (y la fiebre paratifoidea) es causada por la bacteria llamada *Salmonella Typhi*, *Paratyphi* A o *Paratyphi* B, normalmente encontrada en las heces u orina.

¿Cuáles son los síntomas de una infección por fiebre tifoidea?
Los síntomas más comunes de ver son un desarrollo gradual de fiebre, dolores de cabeza, malestar general, dolor abdominal, cambios en el estado conciencia, y estreñimiento. Pueden También aparecer puntos rosados en el cuerpo.

¿Cómo se transmite la fiebre tifoidea?
La bacteria se puede transmitir al consumir alimentos o beber agua contaminada o “ensuciada” con heces u orina. Las personas infectadas pueden transmitir la bacteria si no se lavan las manos luego de ir al baño y luego manipulan alimentos. Otras fuentes de infección pueden ser consumir mariscos que vienen de aguas contaminadas o verduras cultivadas en suelos contaminados.

¿Por cuánto tiempo puede alguien con fiebre tifoidea contagiar a otros?
La mayoría de las personas pueden mantener la infección con la bacteria por 12 semanas luego de que se les haya curado la enfermedad. Un porcentaje pequeño de personas infectadas pueden mantener la infección permanentemente en la vesícula.

¿Quién puede contraer la fiebre tifoidea?
Cualquiera puede infectarse con fiebre tifoidea, pero tiende a ser más reconocida en niños menores de cuatro años.

¿Cómo se trata la fiebre tifoidea?
La mayoría de las infecciones por *Salmonella* se curan solas. Las personas que tienen diarrea deben tomar líquidos en abundancia. Sin embargo, para las infecciones invasivas, los médicos pueden recomendar tratamiento con antibióticos.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Ya que la bacteria se encuentra en las heces, los niños deben abstenerse de ir a la escuela o a centros de cuidado, y las personas que trabajen sirviendo comida deben ser excluidos del trabajo hasta que hayan tenido 3 cultivos de heces negativos que sean consecutivos, tomados un mes aparte o que hayan pasado 3 meses desde que notificaron de su enfermedad.

¿Cómo puedo protegerme yo y proteger a mi familia contra la fiebre tifoidea?
- Lávese las manos con frecuencia con agua y jabón, sobre todo después de usar el baño, cambiar pañales y antes de preparar o comer alimentos. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
- Evite agua o comida que puedan provenir de fuentes contaminadas.
- Lave bien las frutas y verduras antes de comerlas o cortarlas.
- Refrigere los alimentos en cuanto llegue a casa; minimice el tiempo que los alimentos pasan a temperatura ambiente.
- Lave inmediatamente los tableros para cortar y mostradores que usó para preparar estos alimentos, de esta forma evita que otros alimentos se puedan contaminar también.
- Asegúrese que los alimentos lleguen a la temperatura de cocción interna correcta, particularmente cuando esté cocinando en un microondas.
Varicella-Zoster Infections (Chickenpox and Shingles)

Summary
Varicella (chickenpox) is primarily a disease of childhood. Diagnosis is often made clinically, but can be confirmed with polymerase chain reaction (PCR), direct fluorescent antibody (DFA), culture, or serology. Universal immunization is recommended, and vaccine can also be used for post exposure prophylaxis in exposed susceptible persons as appropriate. Since the introduction of varicella vaccine, atypical chickenpox has become increasingly common. Herpes zoster ("shingles") is a re-activation of latent varicella-zoster virus in the dorsal root ganglia.

Agent
Varicella-zoster virus (human herpesvirus 3).

Transmission
Reservoir:
Humans.

Mode of transmission:
Person-to-person transmission occurs when the virus comes in contact with the mucosa of the upper respiratory tract or the conjunctiva, most commonly by the airborne route from direct contact with patients with chickenpox or herpes zoster. In utero infection can occur as a result of transplacentical passage of virus during maternal varicella infection.

Period of communicability:
Most contagious 1-2 days before onset of rash and continuing until all lesions have crusted (usually five days). Contagiousness may be prolonged in patients with altered immunity. Susceptible exposed persons should be considered infectious from 8-21 days following exposure.

Clinical Disease
Incubation period:
Usually 14-16 days (up to 21 days); may be prolonged up to 28 days after administration of passive immune globulin (Vari-ZIG).

Illness:
Some infections are subclinical or missed because of few lesions. Children typically have low-grade fever and mild upper respiratory tract symptoms before onset of rash. Rash appears in successive crops, with several stages of maturity at the same time. If severe, lesions may occur on the conjunctiva, mucous membranes, palms and soles. Initial lesions are maculopapular on an erythematous base, and then evolve from papule to vesicle to pustule to crust over 2-5 days. Lesions usually do not scar unless unusually deep or secondarily infected. The disease can be more severe in adolescents, adults, and immunocompromised persons.

In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is almost always mild with fewer than 50 skin lesions.
and shorter duration of illness. The rash may also be atypical in appearance (maculopapular with few or no vesicles).

Herpes zoster (shingles) is a dermatomal re-activation of varicella-zoster virus that has remained latent in the dorsal root ganglia. Grouped vesicular lesions appear in the distribution of 1-3 dermatomes. Zoster can become disseminated in immunocompromised persons.

Laboratory Diagnosis

For both unvaccinated and vaccinated persons, DNA detection methods (PCR, DFA) and culture are the methods of choice for laboratory confirmation. Of these, PCR is the most reliable method for confirming infection.

In unvaccinated persons, experience is limited with IgM antibody tests and with timing of the IgM response. In vaccinated persons, even less experience with serologic methods for laboratory confirmation is available. Therefore, DNA detection methods are the laboratory methods of choice for diagnosis. A negative IgM result should not be used to rule out the diagnosis. A positive IgM in the absence of rash should not be used to confirm a diagnosis. A four-fold rise in IgG antibody may not occur in vaccinated persons.

Laboratory tests available for varicella confirmation.

<table>
<thead>
<tr>
<th>Test</th>
<th>Specimen</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue culture</td>
<td>Vesicular fluid; biopsy specimens from sterile sites (e.g., CSF, joint fluid)</td>
<td>Used to detect VZV. Can be expensive. Limited availability. Requires up to a week for result.</td>
</tr>
<tr>
<td>PCR</td>
<td>Vesicular swabs or scrapings; scrapings from maculopapular lesions; scabs from crusted lesions; biopsy tissue</td>
<td>Very sensitive and specific for detecting VZV. Real-time methods (not widely available and require special equipment) have been designed that distinguish vaccine strain from wild-type. Results rapidly available (within 3 hours).</td>
</tr>
<tr>
<td>DFA</td>
<td>Vesicle scraping; swab of lesion base (must include cells)</td>
<td>Identify VZV. More rapid and sensitive than culture. Less sensitive than PCR.</td>
</tr>
<tr>
<td>Tzanck smear</td>
<td>Vesicle scraping; swab of lesion base (must include cells)</td>
<td>Detects multinucleated giant cells with inclusions. Diagnostic of alpha herpes viruses (VZV, herpes simplex viruses). Less sensitive than DFA.</td>
</tr>
<tr>
<td>Capture IgM</td>
<td>Acute or convalescent serum specimens for VZV IgM</td>
<td>Specific. IgM inconsistently detected. Not reliable method for routine confirmation, especially in vaccinated persons, but positive result indicates current/recent VZV immune response. However,</td>
</tr>
</tbody>
</table>
positive results in the absence of clinical disease would not be considered confirmation of active varicella disease. Requires special equipment.

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA</td>
<td>Acute and convalescent serum specimens for IgG</td>
</tr>
<tr>
<td>LA</td>
<td>Acute and convalescent serum specimens for IgG</td>
</tr>
<tr>
<td>IFA</td>
<td>Acute and convalescent serum specimens for IgG</td>
</tr>
<tr>
<td>gpELISA</td>
<td>Acute and convalescent serum specimens for IgG</td>
</tr>
<tr>
<td>FAMA</td>
<td>Acute and convalescent serum specimens for IgG</td>
</tr>
</tbody>
</table>

Abbreviations: CSF, cerebrospinal fluid; VZV, varicella-zoster virus; PCR, polymerase chain reaction; DFA, direct fluorescent antibody; EIA, enzyme immunoassay; LA, latex agglutination; IFA, indirect fluorescent antibody; gpELISA, glycoprotein-based enzyme-linked immunosorbent assay; FAMA, fluorescent antibody to membrane antigen.

**Treatment**

- Symptomatic treatment primarily.
- A variety of antiviral agents are available for treatment of complicated cases or cases at high-risk for complications (e.g., immunocompromised persons).
- Children with varicella should not receive salicylates because of the risk of subsequent Reye syndrome.

**Surveillance**

Case Definition:

*Clinical case definition* – An illness with acute onset of diffuse (generalized) maculopapular vesicular rash without other apparent cause. In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is usually mild with fewer than 50 skin lesions and shorter duration of illness. The rash may also be atypical in appearance (maculopapular with few or no vesicles).

*Laboratory Criteria for Diagnosis:*
- Isolation of varicella-zoster virus (VZV) or demonstration of VZV DNA by direct fluorescent antibody (DFA) or by polymerase chain reaction (PCR) tests from a clinical specimen, ideally scabs, vesicular fluid, or cells from the base of a lesion. These tests are also useful for diagnosing breakthrough disease (See above table).
- Positive serologic test for varicella-zoster IgM antibody.
- Four-fold or greater rise in serum varicella IgG antibody titer by any standard serologic assay.

**Confirmed** - An acute illness with diffuse (generalized) maculopapular vesicular rash, and epidemiologic linkage to another probable or confirmed case, or laboratory confirmation by any of the following:

- Isolation of varicella virus from a clinical specimen, or
- Varicella antigen detected by direct fluorescent antibody test, or
- Varicella-specific nucleic acid detected by polymerase chain reaction (PCR), or
- Significant rise in serum anti-varicella immunoglobulin G (IgG) antibody level by any standard serologic assay.

**Probable** - An acute illness with

- Diffuse (generalized) maculopapular vesicular rash, and
- Lack of laboratory confirmation, and
- Lack of epidemiologic linkage to another probable or confirmed case.

**Suspect** -

- IgM positive without clinical signs or symptoms associated with chickenpox.

**Reporting**: Report all confirmed or probable cases of primary varicella to the Epidemiology and Response Division (ERD) at 505-827-0006. Information needed includes: patient's name, age, sex, race, ethnicity, home address, home phone number, occupation, health care provider, varicella immunization history, an estimation of disease severity based on the number of lesions (see below), and the name of the diagnosing health care provider. Investigation information should also be entered in NM-EDSS per established procedures.

**Case Investigation**: Assess susceptible exposed persons, including household contacts.

**Control Measures**

1. Case management
   1.1. Isolation:
      1.1.a Exclude infected persons from child care, school, health care, or care of immune impaired individuals until all lesions are crusted. Zoster (shingles) that can be covered by clothing does not require exclusion except for contact with immune impaired persons.
1.1.b For hospitalized patients, standard, airborne and contact precautions should be used for as long as the rash remains vesicular (minimum of five days after the onset of rash).

- Immunocompromised persons with herpes zoster or patients with disseminated herpes zoster require airborne and contact precautions for the duration of illness.

1.2. Prophylaxis: Not applicable.

2. Contact management

2.1. Isolation:

2.1.a For hospital exposure, all exposed susceptible patients should be placed in airborne and contact precautions from 8-21 days after exposure to the index patient. Precautions should be maintained until 28 days after exposure for those who received passive immune globulin (Varicella-zoster immune globulin (VariZIG), or IGIV if VariZIG is unavailable.

2.1.b Airborne and contact precautions are recommended for neonates born to mothers who developed varicella during the peripartum period. Precautions should be continued until 21 days of age (or 28 days if VariZIG or IGIV given) if the neonate remains hospitalized.

2.1.c Susceptible contacts should be furloughed or excused from patient contact from 8-21 days after exposure unless VZIG or IGIV has been given (then continue exclusion to 28 days).

2.1.d Occurrence of a case (either patient or staff) in a health care facility should result in rapid identification of non-immune individuals and those at risk of severe illness. Healthy non-immune contacts may be offered immunization, but quarantine 8-21 days after exposure will still be necessary. Pregnant or immune impaired contacts should be assessed for immunity and given VZIG or IGIV and/or antiviral treatment as indicated.

2.2. Prophylaxis:

2.2.a Varicella-zoster immune globulin (VariZIG) or IGIV given from 96 hours to 10 days of exposure may prevent or modify illness in susceptible exposed contacts. It is indicated for susceptible high-risk persons (i.e., immunocompromised children with no history of varicella and/or unknown or negative serologic tests; non-immune pregnant women; immunocompromised persons; neonates born to mothers who develop varicella within five days before to two days after delivery; hospitalized preterm infants >28 weeks whose mother lacks a reliable history or serologic evidence of previous infection; hospitalized preterm infants <28 weeks regardless of maternal history or immune status). The decision to administer VariZIG or IGIV depends on three factors: 1) the likelihood that the exposed person has no immunity to varicella; 2) the probability that a given exposure to varicella or zoster will result in infection; and, 3) the likelihood that complications of varicella will develop if the person is infected. The degree and type of immunosuppression should be considered in making this decision.

2.2.b Varicella vaccine may be used to prevent or modify illness if given to susceptible persons who are appropriate candidates ideally within 3 but up to 5 days after exposure to varicella. Immunization of susceptible exposed persons more than
five days after exposure is not effective in preventing disease but will produce immunity in persons who are not infected and should be considered, particularly in outbreak settings where prolonged transmission is anticipated.

3. Prevention

3.1. Immunization: Universal immunization with attenuated live virus vaccine is recommended for infants beginning at 12 months of age with a second dose recommended at 4 to 6 years of age. However, the minimum interval between first and second doses in children up to 13 years of age is three months. This interval is based on the design of the studies evaluating two doses in this age group. If a second dose is inadvertently administered between 28 days and 3 months after the first dose, it does not need to be repeated. Adolescents 13 years of age and older, and adults born after 1980, who do not have a documented history of primary varicella or serologic evidence of immunity, should also receive two doses of varicella vaccine at least 4-8 weeks apart. Children and adults with impaired immunity should be immunized only with the concurrence of their physician. Their household contacts should be immunized to minimize their exposure.

4. Evidence of immunity to varicella: Evidence of immunity to varicella includes any of the following:

4.1. Documentation of age appropriate immunization.
   - Preschool-aged children (i.e., ≥12 months of age): One dose
   - School-aged children, adolescents, and adults: Two doses

Post-immunization serologic testing is neither necessary nor recommended following immunization, including in health care personnel.

4.2. Laboratory evidence of immunity or laboratory confirmation of disease.

4.3. Varicella diagnosed by a health care provider (physician, nurse practitioner, physician assistant or nurse) or verification of history of varicella disease. In cases of atypical and/or mild disease, assessment by a physician or physician designee is recommended and one of the following should be sought: 1) an epi-link to a typical varicella case or to a laboratory confirmed case; or 2) laboratory confirmation, if it was performed at the time of acute disease. When such documentation is lacking, people should not be considered as having a valid history of disease because other diseases may mimic mild atypical varicella.

4.4. History of herpes zoster diagnosed by a physician.

4.5. Birth in the United States before 1980. However, for health care professionals, pregnant women and immunocompromised people, birth before 1980 should not be considered evidence of immunity.

Managing Varicella in Child Care Centers and School Settings

1. Report all suspected child care center or school outbreaks to ERD at 505-827-0006.

2. Exclude infected persons from child care or school until all lesions are crusted (usually 5-6 days).

3. Identify all pregnant females and immunocompromised individuals (students and staff) who have been exposed to varicella and consult ERD for further recommendations.
4. Varicella vaccine should be considered, in coordination with ERD, to control outbreaks in child care centers and schools.

References


What is chickenpox?

Chickenpox is a contagious disease caused by a virus called Varicella-zoster.

What are the symptoms of chickenpox?

Symptoms usually occur about two weeks after exposure. Initial symptoms include sudden onset of fever and feeling tired and weak. Soon after, an itchy blister-like rash will appear on the body, possibly including on the eyelids and in the mouth. New spots (lesions) continue to appear for about 3 or 4 days. The spots will dry up and scab over before falling off. Usually this disease is more serious in adults than in children.

How is chickenpox spread?

Chickenpox is easily spread from person-to-person by airborne droplets from the nose or throat of an infected person. Contact with the fluid from the lesions may also spread the disease. Another way to get chickenpox is by touching articles that are freshly soiled by the infected person's chickenpox lesions.

How long are people contagious?

A person is probably the most contagious 1 to 2 days before the rash appears and for as long as five days after the rash begins. Once all the lesions scab or crust, the person can no longer spread the disease.

Who gets chickenpox?

Anyone can get chickenpox, but those who are not vaccinated are at greater risk. Chickenpox usually results in lifelong immunity. However, this infection may remain hidden and recur years later as herpes zoster (shingles) in some older adults and sometimes in children.

What treatment is available for people with chickenpox?

In healthy children, chickenpox is usually a mild disease. Treatment for children is usually aimed at reducing itch and discomfort. In persons with weakened immune systems or pregnant women, the disease can be more severe. These people should see their doctor if they were exposed to chickenpox or become sick with chickenpox. If a woman gets chickenpox when she is pregnant, it could be dangerous for the baby.

Do infected people need to be kept home from school, work or daycare?

Persons with chickenpox should stay home for five days after the beginning of the chickenpox rash or until all the lesions become dry (usually 5-6 days). Special care should be taken not to expose pregnant women or persons with weak immune systems to chickenpox.

How can I protect myself and my family from getting chickenpox?

- Make certain your children are up to date on their vaccines.
- Wash hands frequently with water and soap. (Sanitizing gel may be substituted when hands are not visibly soiled.)
¿Qué es la varicela?
La varicela es una enfermedad contagiosa causada por un virus que se llama varicela zoster.

¿Cuáles son los síntomas de la varicela?
Los síntomas suelen aparecer a las dos semanas después de estar expuesto. Los síntomas iniciales incluyen: aparición repentina de fiebre, cansancio y debilidad. Poco después, aparece por el cuerpo, incluyendo los párpados y dentro de la boca, un sarpullido formado por pequeñas ampollas que causan picazón. Continúan apareciendo nuevas ampollas durante 3 ó 4 días. Estas ampollas se secan y forman una costra que después se cae. Normalmente esta enfermedad es más seria en adultos que en niños.

¿Cómo se transmite la varicela?
La varicela se transmite fácilmente de persona a persona a través de las pequeñas gotitas que pasan al aire cuando la persona que tiene la enfermedad tose o estornuda. También se puede contagiar por contacto directo con el líquido de las ampollas de la varicela. Otra forma de contagio es al tocar cosas que han estado en contacto con las ampollas de la persona infectada.

¿Por cuánto tiempo puede alguien con varicela contagiar a otros?
 Uno o dos días antes de que comience el sarpullido, es cuando hay más riesgo de contagio. Existe peligro de contagio hasta 5 días después de que el sarpullido haya comenzado. Una vez que todas las ampollas forman la costra, ya no se puede transmitir la enfermedad.

¿Quién puede contraer la varicela?
Cualquier persona puede contraer la varicela, pero aquellos que no están vacunados tienen un riesgo mayor. Una vez que se ha pasado la varicela, deja inmunidad para toda la vida. Sin embargo, el virus puede quedar oculto y reaparecer años más tarde como herpes zoster (culebrilla) en algunas personas de la tercera edad y, a veces, en niños.

¿Cómo se trata la varicela?
En niños sanos, la varicela es una enfermedad leve. El tratamiento para niños usualmente busca aliviar el malestar y la picazón. En personas que tienen su sistema inmunológico debilitado o en mujeres embarazadas, la enfermedad puede volverse más grave. Estas personas deben ir a su médico si estuvieron expuestas a la varicela o se enfermaron. Si una mujer contrae la varicela mientras está embarazada, puede ser peligroso para el bebé.

¿Es necesario quedarse en casa y no ir a la escuela, a la guardería o al trabajo?
Las personas que tienen varicela deben quedarse en casa por 5 días después de que haya empezado el sarpullido o hasta que todas las costras se hayan secado (típicamente 5 o 6 días). Es necesario tomar las medidas necesarias para que las mujeres embarazadas o las personas cuyo sistema inmunológico esté debilitado no se vean expuestas a esta enfermedad.

¿Cómo puedo protegerme yo y también proteger a mi familia contra la varicela?
- Asegúrese de que las vacunas de sus niños estén al día.
- Lávese las manos con frecuencia con agua y jabón. (En lugar de lavárselas puede usar un gel desinfectante para manos cuando no se vean sucias).
### APPENDIX 1: Table of Foodborne Illnesses and Associated Clinical Characteristics

#### Bacterial Agents: Table of Foodborne Illnesses and Associated Clinical Characteristics

<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)</th>
<th>Signs and Symptoms</th>
<th>Duration</th>
<th>Associated foods</th>
<th>Period of Communicability</th>
<th>CDC criteria for outbreak confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Bacillus cereus</em></td>
<td>6-24 hours</td>
<td>Abdominal cramps, watery diarrhea, nausea.</td>
<td>24-48 hours</td>
<td>Meats, stews, gravies, vanilla sauce.</td>
<td>Not communicable (enterotoxin formed in vivo).</td>
<td>Isolation of organism from stool of two or more ill persons OR isolation of $10^5$ organisms/g from epidemiologically implicated food. Contact Environmental Micro section regarding food collection 505 383-9129</td>
</tr>
<tr>
<td>(diarrheal form)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><em>Bacillus cereus</em></td>
<td>1-6 hours</td>
<td>Sudden onset of severe nausea and vomiting, diarrhea may be present.</td>
<td>24 hours</td>
<td>Improperly refrigerated cooked and fried rice, meats.</td>
<td>Not communicable (preformed enterotoxin).</td>
<td>Isolation of organism from stool of two or more ill persons and not from stool of control patients OR isolation of $10^6$ organisms/g from epidemiologically implicated food, provided specimen is properly handled. Enteric Transport Kit (ETM). Refrigerate not frozen, place in container. Stool in ETM must be received at SLD within 48 hours of collection.</td>
</tr>
<tr>
<td>(emetic form)</td>
<td></td>
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</tr>
<tr>
<td>Brucellosis</td>
<td>Several days to several months; usually &gt;30 days</td>
<td>Fever, chills, sweating, weakness, headache, muscle and joint pain, diarrhea, bloody stool during acute phase.</td>
<td>Weeks</td>
<td>Unpasteurized milk, unpasteurized cheese, contaminated meat.</td>
<td>Not known to be communicable from person-to-person.</td>
<td>Two or more ill persons and isolation of organism in culture of blood or bone marrow; greater than fourfold increase in standard agglutination titer (SAT) over several weeks, or single SAT 1:160 in person who has compatible clinical symptoms and history of exposure. Call SLD General Microbiology (505-383-9128) for blood culture options and SLD Virology/Serology (505-383-9124) for antibody titer serology. Blood for testing must be separated and serum frozen.</td>
</tr>
<tr>
<td>(<em>Brucella abortus, B. melitensis, B. suis</em>)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agent</td>
<td>Usual Incubation Period (Range)</td>
<td>Signs and Symptoms</td>
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</tr>
<tr>
<td>Campylobacter</td>
<td>2-10 days; usually 2-5 days</td>
<td>Diarrhea, cramps, vomiting and fever; diarrhea may be bloody.</td>
<td>2-10 days</td>
<td>Raw and undercooked poultry, unpasteurized milk, contaminated water.</td>
<td>Excreted for 2-7 weeks; uncommon to have person-to-person spread.</td>
<td>Isolation of organism from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. Contact Env. Micro section regarding food collection 505 383-9129</td>
</tr>
<tr>
<td><em>Clostridium botulinum</em> (Foodborne botulism)</td>
<td>2 hrs-8 days; usually 12-48 hrs.</td>
<td>Vomiting, diarrhea, blurred vision, diplopia, dysphagia, descending muscle weakness.</td>
<td>Days to months, can be complicated by respiratory failure and death</td>
<td>Home-canned foods with a low acid content, improperly canned commercial foods, home-canned or fermented fish, foil-wrapped baked potatoes.</td>
<td>Not communicable (preformed enterotoxin)</td>
<td>Detection of botulinum toxin in serum, stool, gastric contents, or implicated food OR isolation of organism from stool or intestine.</td>
</tr>
<tr>
<td><em>Clostridium botulinum</em> (infant botulism)</td>
<td>3-30 days</td>
<td>Infants &lt;12 months: lethargy, weakness, poor feeding, constipation, poor gag and sucking reflex.</td>
<td>Variable</td>
<td>Raw honey, home-canned vegetables and fruits, corn syrup. (Majority of cases not associated with food)</td>
<td>Not communicable (preformed enterotoxin)</td>
<td>Detection of botulinum toxin in serum, stool, gastric contents, or implicated food OR isolation of organism from stool or intestine.</td>
</tr>
<tr>
<td><em>Clostridium perfringens</em></td>
<td>6-24 hours</td>
<td>Watery diarrhea, nausea, abdominal cramps.</td>
<td>24-48 hours</td>
<td>Meats, poultry, gravy, dried or precooked foods.</td>
<td>Not communicable (enterotoxin formed in vivo).</td>
<td>Isolation of $10^6$ organisms/g from stool of two or more ill persons, provided specimen is properly handled OR demonstration of enterotoxin in the stool of two or more ill persons OR isolation of $10^6$ organisms/g from epidemiologically implicated food, provided specimen is properly handled.</td>
</tr>
</tbody>
</table>

**SLD Test Kit**

See SLD Biological Sciences Bureau directory of services for up to date information [https://nmhealth.org/about/sld/](https://nmhealth.org/about/sld/).
<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)²³⁴</th>
<th>Signs and Symptoms²³⁴</th>
<th>Duration²³</th>
<th>Associated foods²</th>
<th>Period of Communicability²³</th>
<th>CDC criteria for outbreak confirmation²</th>
<th>SLD Test Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterohemorrhagic E. coli (EHEC) including E. coli O157:H7 and other Shiga toxin-producing E. coli (STEC)</td>
<td>1-10 days; usually 3-4 days</td>
<td>Diarrhea that is often bloody, severe abdominal pain; fever occurs in less than 1/3 of cases.</td>
<td>5-10 days</td>
<td>Ground beef, unpasteurized milk and juice, fresh produce, ingestion of contaminated water also contact in petting zoos (sheep, deer, calves).</td>
<td>For the duration of excretion of the pathogen; typically a week or less in adults, but 3 weeks in 1/3 of children</td>
<td>Isolation of E. coli O157:H7 or other Shiga-like toxin-producing E. coli from clinical specimen from two or more ill persons OR isolation of E. coli O157:H7 or other Shiga-like toxin-producing E. coli from epidemiologically implicated food.</td>
<td>Enteric Transport Kit (Stool in preservative, refrigerated). Must be received at SLD within 48 hours of collection. Contact Env. Micro section regarding food collection 383-9129</td>
</tr>
<tr>
<td>Enterotoxigenic E. coli (ETEC)</td>
<td>6-48 hrs.</td>
<td>Diarrhea, abdominal cramps, nausea; vomiting and fever less common</td>
<td>3-7 days or longer</td>
<td>. Contaminated fruits, vegetables and water.</td>
<td>For the duration of excretion of the pathogen, this may be prolonged. (Rare in the US, more common in infants and travelers to resource limited countries)</td>
<td>Isolation of organism of same serotype, demonstrated to produce heat-stable (ST) and/or heat-labile (LT) enterotoxin, from stool of two or more ill persons.</td>
<td>Testing not available at SLD.</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>1-6 wks.</td>
<td>Fever, muscle aches and nausea or diarrhea. Pregnant women may have mild flu-like illness and infection may lead to miscarriage. High risk patients may have meningitis or sepsis. Neonates may have pneumonia, sepsis or meningitis</td>
<td>Variable</td>
<td>Unpasteurized milk, fresh soft cheeses, ready-to-eat deli meats, hot dogs, melons, fruit salads</td>
<td>Infected persons can shed the organism for a week to several months.</td>
<td>Isolation of organism of same serotype from stool of two or more ill persons exposed to food that is epidemiologically implicated or from which organism of same serotype has been isolated.</td>
<td>Stool culture not useful. CSF or blood serum collected and cultured at SLD. Call General Microbiology (505-383-9128) for more detail. Contact Env. Micro section regarding food collection 383-9129</td>
</tr>
<tr>
<td>Agent</td>
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</tr>
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</tr>
<tr>
<td><em>Salmonella</em> species (non-typhi)</td>
<td>6 hrs-10 days; usually 6-48 hrs.</td>
<td>Diarrhea, fever, abdominal pain, nausea, headache.</td>
<td>4-7 days</td>
<td>Eggs, poultry, meat, unpasteurized milk or juice, contaminated fresh produce.</td>
<td>Throughout course of infection; carrier state may occur with excretion months to &gt;1 year.</td>
<td>Isolation of organism of same serotype from clinical specimens from two or more ill person OR isolation of organism from epidemiologically implicated food.</td>
<td></td>
</tr>
</tbody>
</table>

Enteric Transport Kit. (Stool in preservative, refrigerated; must be received at SLD within 48 hours of collection)

| *Salmonella* typhi | 3-60 days; usually 7-14 days | Gradual onset of fever, headache, malaise, anorexia, abdominal pain. May have rose-colored spots on trunk, hepato-splenomegaly. | 4-7 days | Food or water contaminated by feces or urine of infected patients or chronic carriers. | As long as organism is in excreta (i.e., stool or urine); 2-5% of infected persons become permanent gallbladder carriers. | Isolation of organism from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. |

Enteric Transport Kit (stool in preservative, refrigerated; must be received at SLD within 48 hours of collection)

| *Shigella* spp. | 12 hrs-6 days; usually 2-4 days | Diarrhea (sometimes bloody), often accompanied by fever and abdominal cramps | 4-7 days | Food or water contaminated by feces of infected persons. (Majority of cases are person-to-person spread). | During acute phase of illness, and usually less than 4 weeks | Isolation of organism of same species or serotype from clinical specimens from two or more ill persons OR isolation of organism from epidemiologically implicated food. |

Enteric Transport Kit (stool in preservative, refrigerated; must be received at SLD within 48 hours of collection)

| *Staphylococcus* aureus | 30 min-8 hrs.; usually 2-4 hrs. | Vomiting, diarrhea | 24-48 hours | Unrefrigerated or improperly refrigerated foods. | Not communicable (preformed enterotoxin) | Isolation of organism of same phage type from stool or vomitus of two or more ill persons OR detection of enterotoxin in epidemiologically implicated food OR isolation of 105 organisms/g from epidemiologically implicated food, provided specimen is properly handled. |

Enteric Transport Kit (stool or emesis in preservative, refrigerated; must be received at SLD within 48 hours of collection).
<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)</th>
<th>Signs and Symptoms</th>
<th>Duration</th>
<th>Associated foods</th>
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</tr>
</thead>
<tbody>
<tr>
<td><em>Vibrio cholerae</em>, O1 or O139</td>
<td>1-5 days</td>
<td>Profuse watery diarrhea and vomiting.</td>
<td>3-7 days</td>
<td>Fish, shellfish, water or food contaminated by infected persons.</td>
<td>Usually a few days after recovery, except carrier state.</td>
<td>Isolation of toxigenic organism from stool or vomitus of two or more ill persons OR significant rise in vibriocidal, bacterial-agglutinating, or antitoxin antibodies in acute- and early convalescent-phase sera among persons not recently immunized OR isolation of toxigenic organism from epidemiologically implicated food.</td>
</tr>
<tr>
<td><em>Vibrio parahaemolyticus</em></td>
<td>4-30 hrs.</td>
<td>Watery diarrhea, abdominal cramps, nausea, vomiting.</td>
<td>2-5 days</td>
<td>Undercooked or raw fish or shellfish.</td>
<td>Not normally communicable from person-to-person.</td>
<td>Isolation of <em>Vibrio spp.</em> from stool of two or more ill persons OR isolation of <em>Vibrio spp.</em> from epidemiologically implicated food, provided specimen is properly handled.</td>
</tr>
<tr>
<td><em>Yersinia enterocolitica</em> and <em>Yersinia pseudotuberculosis</em></td>
<td>1-10 days; usually 4-6 days</td>
<td>Appendicitis-like symptoms (diarrhea and vomiting, fever, and abdominal pain) occur primarily in older children and young adults. May have a scarlatiniform rash with <em>Y. pseudotuberculosis</em>.</td>
<td>1-3 weeks</td>
<td>Undercooked pork, unpasteurized milk, tofu, contaminated water. Infection has occurred in infants whose caretakers handled pig intestines.</td>
<td>Secondary transmission appears rare. There is fecal shedding as long as symptoms exist. Untreated cases may excrete organism for 2-3 months. Prolonged asymptomatic carriage has been reported in children and adults.</td>
<td>Isolation of organism from clinical specimen from two or more ill persons OR isolation of pathogenic strain of organism from epidemiologically implicated food.</td>
</tr>
</tbody>
</table>

**SLD Test Kit**

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## Viral Agents: Table of Foodborne Illnesses and Associated Clinical Characteristics

<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)</th>
<th>Signs and Symptoms</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Norovirus (and other caliciviruses)</td>
<td>12-48 hrs. (median 33 hours)</td>
<td>Nausea, vomiting, abdominal cramps, watery diarrhea, may include myalgia and some headache. Diarrhea is more prevalent in adults and vomiting is more prevalent in children.</td>
<td>16-60 hours</td>
<td>Shellfish harvested from contaminated waters, fecally-contaminated foods, ready-to-eat foods contaminated by infected food handlers such as salads, cookies, ice, sandwiches, fruit and leafy vegetables.</td>
<td>Extremely contagious, precise time when infected person is no longer contagious is unknown. Shown to be shed in stool and vomitus; viral shedding averages 4 weeks after infection and peaks 2-5 days.</td>
<td>Detection of viral RNA in at least two bulk stool or vomitus specimens by real-time or conventional reverse transcriptase-polymerase chain reaction (RT-PCR) OR visualization of viruses (NoV) with characteristic morphology by electron microscopy in at least two or more bulk stool or vomitus specimens OR two or more stools positive by commercial enzyme immunoassay (EIA).</td>
</tr>
<tr>
<td>Rotavirus (Retroviridae family-Group A most common)</td>
<td>1-3 days</td>
<td>Vomiting, fever, watery diarrhea, may result in severe dehydration in young children.</td>
<td>4-6 days</td>
<td>Foods handled by infected person, or foods prepared in proximity to diapered, ill infants; contaminated water.</td>
<td>During acute phase and shed up to 8 days after symptoms resolve.</td>
<td>Detection of organism in stool of two or more ill persons.</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>15-50 days; median: 28 days</td>
<td>Diarrhea, dark urine, jaundice, fever, headache, nausea, and abdominal pain.</td>
<td>Variable, 2 weeks-3 months</td>
<td>Shellfish harvested from contaminated waters, fecally-contaminated foods, ready-to-eat foods contaminated by infected food handlers.</td>
<td>Maximum infectivity occurs during the 1 to 2 weeks before illness onset and diminishes by one week after onset of jaundice.</td>
<td>Detection of immunoglobulin M antibody to hepatitis A virus (IgM anti-HAV) in serum from two or more persons who consumed epidemiologically implicated food. Serologic testing available at SLD. Contact Virology/Serology (505-383-9124). Blood sample with serum separated off. Refrigerated serum must be tested within 7 days of collection. If shipment will take longer, specimen must be frozen at -20°C (-4°F) and shipped on dry ice.</td>
</tr>
</tbody>
</table>

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1. Table Entry: "Viral Agents: Table of Foodborne Illnesses and Associated Clinical Characteristics"
Parasitic Agents: Table of Foodborne Illnesses and Associated Clinical Characteristics  

<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)</th>
<th>Signs and Symptoms</th>
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<th>CDC criteria for outbreak confirmation</th>
<th>SLD Test Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryptosporidium</td>
<td>2-28 days; median: 7 days</td>
<td>Diarrhea (usually watery), stomach cramps, upset stomach, slight fever.</td>
<td>May be remitting and relapsing over weeks to months.</td>
<td>Drinking water, food contaminated by infected food handlers.</td>
<td>Usually two weeks after recovery, but shedding can continue for up to two months.</td>
<td>Demonstration of oocysts in stool or in small-bowel biopsy of two or more ill persons OR demonstration of organism in epidemiologically implicated food.</td>
<td>No testing done at SLD, may forward specimens to CDC. Contact General Micro 505 383-9128</td>
</tr>
<tr>
<td>Cyclospora cayetanensis</td>
<td>1-14 days; median: 7 days</td>
<td>Diarrhea (usually watery), loss of appetite, weight loss, stomach cramps, nausea, vomiting, fatigue.</td>
<td>May be remitting and relapsing over weeks to months.</td>
<td>Fresh produce, berries, lettuce, herbs.</td>
<td>Unknown, person-to-person transmission has not been documented.</td>
<td>Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons OR demonstration of the parasite in epidemiologically implicated food.</td>
<td>No testing done at SLD, may forward specimens to CDC. Contact General Micro 505 383-9128</td>
</tr>
<tr>
<td>Giardia lamblia</td>
<td>3-25 days; median: 7 days</td>
<td>Diarrhea, stomach cramps, gas.</td>
<td>Days to weeks</td>
<td>Any food contaminated by infected food handler, drinking water.</td>
<td>As long as the organism is excreted in stool. Symptomatic giardiasis in adults usually lasts from 2 weeks to 2 months.</td>
<td>Demonstration of the parasite in stool or small bowel biopsy specimen of two or more ill persons.</td>
<td>No testing done at SLD.</td>
</tr>
<tr>
<td>Trichinella spp.</td>
<td>1-2 days for intestinal phase; 2-4 wks. for systemic phase</td>
<td>Fever, nausea, diarrhea, vomiting, weakness, myalgia, periorbital edema, high eosinophil count</td>
<td>May last up to 8 weeks</td>
<td>Infected undercooked meat – especially pork</td>
<td>Unknown, person-to-person transmission has not been documented</td>
<td>Two or more ill persons and positive serologic test or demonstration of larvae in muscle biopsy OR demonstration of larvae in epidemiologically implicated meat.</td>
<td>No testing done at SLD.</td>
</tr>
</tbody>
</table>
### Non-infectious Agents: Table of Foodborne Illnesses and Associated Clinical Characteristics

<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)</th>
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<th>CDC criteria for outbreak confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ciguatoxin</td>
<td>1-48 hrs; usually 2-8 hrs</td>
<td>Usually abdominal pain, nausea, vomiting, diarrhea, followed by neurologic symptoms including paresthesias.</td>
<td>Variable, days to months</td>
<td>Large reef fish (grouper, red snapper, amberjack, and barracuda).</td>
<td>Not communicable.</td>
<td>Demonstration of ciguatoxin in epidemiologically implicated fish OR clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning (e.g., snapper, grouper, or barracuda).</td>
</tr>
<tr>
<td>Scombroid toxin (histamine)</td>
<td>1 min-3 hrs; usually 1 hr</td>
<td>Flushing, rash, burning sensation of skin, mouth and throat, dizziness, urticaria, paresthesias.</td>
<td>3-6 hours</td>
<td>Mishandled fish (bluefin, tuna, skipjack, mackerel, marlin, escolar and mahi mahi)</td>
<td>Not communicable.</td>
<td>Demonstration of histamine in epidemiologically implicated fish OR clinical syndrome among persons who have eaten a type of fish previously associated with histamine fish poisoning (e.g., mahi-mahi or fish of order Scomboidei).</td>
</tr>
<tr>
<td>Paralytic shellfish poisoning (also referred to as Neurotoxic Shellfish Poisoning)</td>
<td>30 minutes to 3 hours</td>
<td>Diarrhea, nausea, vomiting leading to paresthesias of mouth, lips, weakness, dysphagia, dysphonia, respiratory paralysis.</td>
<td>Days</td>
<td>Scallops, mussels, clams, cockles.</td>
<td>Not communicable.</td>
<td>Detection of toxin in epidemiologically implicated food or Detection of large numbers of shellfish-poisoning-associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered.</td>
</tr>
<tr>
<td>Puffer fish (tetrodotoxin)</td>
<td>10 min-3 hrs; usually 10-45 min</td>
<td>Parasthesias, vomiting, diarrhea, abdominal pain, ascending</td>
<td>Death, usually in 4-6 hours</td>
<td>Puffer fish.</td>
<td>Not communicable.</td>
<td>Demonstration of tetrodotoxin in epidemiologically implicated fish OR clinical syndrome among persons who have eaten puffer fish.</td>
</tr>
</tbody>
</table>

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1. [Source: Manual for Investigation and Control of Selected Communicable Diseases, New Mexico Department of Health, Epidemiology and Response Division, Infectious Disease Epidemiology Bureau]
<table>
<thead>
<tr>
<th>Agent</th>
<th>Usual Incubation Period (Range)²,³,⁴</th>
<th>Signs and Symptoms²,³,⁴</th>
<th>Duration³</th>
<th>Associated foods²</th>
<th>Period of Communicability²,³</th>
<th>CDC criteria for outbreak confirmation⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy metals (antimony, cadmium, copper, iron, tin, zinc)</td>
<td>5 min-8 hrs; usually &lt;1 hr</td>
<td>Vomiting, nausea, often metallic taste</td>
<td>Usually self-limited</td>
<td>Acidic foods or beverages prepared stored or cooked in containers coated, lined or contaminated with metal.,</td>
<td>Not communicable.</td>
<td>Demonstration of high concentration of metal in epidemiologically implicated food. No patient testing available. Collect suspect food or metal container and contact Environmental Microbiology (505-383-9129).</td>
</tr>
<tr>
<td>Mushroom toxins, shorter-acting (muscimol, muscarine, psilocybin, coprinus artemenatris, ibotenic acid)</td>
<td>2 hours</td>
<td>Vomiting, diarrhea, confusion, visual disturbance, salivation, diaphoresis, hallucinations, disulfiram-like reaction.</td>
<td>Self-limited</td>
<td>Wild mushrooms</td>
<td>Not communicable.</td>
<td>Clinical syndrome among persons who have eaten mushroom identified as toxic type OR demonstration of toxin in epidemiologically implicated mushroom or food containing mushroom. No patient testing available. Collect suspect food and contact Environmental Microbiology (505-383-9129).</td>
</tr>
<tr>
<td>Mushroom toxins, longer-acting (amanitin)</td>
<td>6-24 hrs</td>
<td>Diarrhea, abdominal cramps, leading to hepatic and renal failure</td>
<td>Often fatal</td>
<td>Mushrooms</td>
<td>Not communicable.</td>
<td>Clinical syndrome among persons who have eaten mushroom identified as toxic type OR demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms. No patient testing available. Collect suspect food and contact Environmental Microbiology (505-383-9129).</td>
</tr>
</tbody>
</table>


APPENDIX 2: Stool Specimen & Enteric Organism Transport

If unsure about specimen or transport please call Scientific Laboratory Division (SLD) at 505-383-9128 or 505 383-9124, or Epidemiology and Response Division at 505-827-0006

Bacteriology

<table>
<thead>
<tr>
<th>Bacterium/Pathogen</th>
<th>Description</th>
<th>Specimen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacillus cereus</strong> Culture</td>
<td>Isolation and identification of <em>Bacillus cereus</em> call 505 383-9127/9128, may require send-out to the CDC</td>
<td>Send stool specimen in Enteric Transport Kit or place in container without preservative. Refrigerate, do not freeze.</td>
</tr>
<tr>
<td><strong>Campylobacter jejuni</strong> Culture</td>
<td>Isolation of <em>Campylobacter</em> from feces.</td>
<td>Send stool in Enteric Transport Kit. Refrigerate. Must be in preservative and received at SLD within 48 hours of collection.</td>
</tr>
<tr>
<td><strong>Clostridium perfringens Toxin</strong></td>
<td>Identification of <em>Clostridium perfringens</em> through culture, Toxin through a toxin assay (sent to CDC). Consult Scientific Laboratory Division-General Microbiology at 505-383-9127/9128.</td>
<td>Send bulk stool specimen in container with or without preservative. Must be refrigerated.</td>
</tr>
<tr>
<td><strong>Escherichia coli 0157:H7 and Shiga Toxin test/isolation</strong></td>
<td>Isolation and identification of Shiga-toxin producing <em>Escherichia coli</em> 0157:H7 and non-O157 from clinical specimens.</td>
<td>Send stool specimens in Enteric Transport Kit. Must be in preservative and refrigerated. Must be received at SLD within 48 hours of collection.</td>
</tr>
<tr>
<td><strong>Salmonella Culture</strong></td>
<td>Isolation and serotyping of <em>Salmonella</em>.</td>
<td>Send stool specimen in Enteric Transport Kit. Must be in preservative, refrigerated, and received at SLD within 48 hours of collection.</td>
</tr>
<tr>
<td><strong>Salmonella Serotyping</strong></td>
<td>Serological identification of all confirmed <em>Salmonella</em> isolates for epidemiologic purposes. Test performed automatically if <em>Salmonella</em> is identified.</td>
<td>See <em>Salmonella</em> culture, specimen.</td>
</tr>
<tr>
<td><strong>Shigella Culture</strong></td>
<td>Isolation and serotyping of <em>Shigella</em>.</td>
<td>Send stool specimen in Enteric Transport Kit. Must be in preservative, refrigerated, and received at SLD within 48 hours of collection.</td>
</tr>
<tr>
<td><strong>Shigella Serotyping</strong></td>
<td>Serological identification of all confirmed <em>Shigella</em> isolates for epidemiologic purposes. Test performed automatically if <em>Shigella</em> is identified.</td>
<td>See <em>Shigella</em> culture.</td>
</tr>
<tr>
<td><strong>Staphylococcus Culture</strong></td>
<td>Isolation and identification of <em>Staphylococcus aureus</em> from fecal specimens. May require send-out to the CDC. Call 505 383-9127/9128</td>
<td>Send stool specimen in Enteric Transport Kit or place in clean container without preservative, within 48 hours of collection, refrigerated.</td>
</tr>
<tr>
<td><strong>Yersinia enterocolitica Culture</strong></td>
<td>Isolation and identification of <em>Yersinia enterocolitica</em> through culture. Call 505 383-9127/9128.</td>
<td>Send stool specimen in Enteric Transport Kit. Must be in preservative, refrigerated, and received at SLD within 48 hours of collection.</td>
</tr>
</tbody>
</table>
### Parasitology

<table>
<thead>
<tr>
<th>Fecal parasites including Cryptosporidium</th>
<th>Description:</th>
<th>exam for the detection of intestinal parasites by polymerase chain reaction (PCR) and/or conventional methods. CDC send out.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specimen:</td>
<td>Send stool specimen in Enteric Transport kit. SLD does not currently test. Contact SLD Bureau Chief, 505 383-9122, or General Microbiology 505 383-9128</td>
</tr>
</tbody>
</table>

**Giardia lamblia**

| Description: | Detection of *Giardia lamblia* antigen through enzyme-immunoassay (EIA), PCR, or by microscopic exam CDC send out. |
| Specimen: | Send stool in Enteric Transport Kit. SLD does not currently test. Contact SLD Bureau Chief, 505 383-9122 or General Microbiology (505) 383-9128 |

### Virology

<table>
<thead>
<tr>
<th>Norovirus and other caliciviruses</th>
<th>Description:</th>
<th>Identification of virus by amplification utilizing polymerase chain reaction (PCR).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen:</td>
<td></td>
<td>Stool and/or vomitus collected in clean container (no preservative). Refrigerate. Can be delivered to SLD up to one week after collection. Call SLD-Virology (505-383-9124/9125) prior to transport.</td>
</tr>
</tbody>
</table>

**Enteric Transport Kit:** For stool culture. Includes 6 X 10 plastic bag, cheesecloth, paraffin strip, Cary-Blair medium/preservative, instruction sheet and General Clinical Request Form. Keep refrigerated and ship in Styrofoam container with cold pack.

To order, send email to DOH-SLD-KitPrep@sld.state.nm.us

**Sterile containers for fresh stool:** For Norovirus and other caliciviruses. May be used for *Clostridium perfringens, Bacillus cereus or Staphylococcus aureus culture and toxin* (send out). Keep refrigerated and ship in Styrofoam container with cold pack.

More detailed collection instructions are available at [https://nmhealth.org/about/sld/](https://nmhealth.org/about/sld/). Click on Biological Sciences Bureau, directory of services.
APPENDIX 3: List of Notifiable Diseases or Conditions in New Mexico
7.4.3.13 New Mexico Administrative Code

ALL REPORTS INCLUDING ELECTRONIC LABORATORY REPORTS OF NOTIFIABLE CONDITIONS MUST INCLUDE:
1. The disease or condition being reported;
2. Patient's name, date of birth/age, gender, race/ethnicity, address, patient's telephone numbers, and occupation;
3. Physician or licensed healthcare professional name and telephone number; and
4. Healthcare facility or laboratory name and telephone number, if applicable. Laboratory or clinical samples for conditions marked with [*] are required to be sent to the Scientific Laboratory Division.

EMERGENCY REPORTING OF DISEASES OR CONDITIONS
The following diseases, confirmed or suspected, require immediate reporting by telephone to Epidemiology and Response Division at 505-827-0006.

Infectious Diseases
Anthrax*  Haemophilus influenzae invasive infections*  Rubella (including congenital)
Avian or novel influenza*  Measles  Severe Acute Respiratory Syndrome (SARS)*
Bordetella species (including pertussis)*  Meningococcal Infections, invasive*  Smallpox*
Botulism (any type)*  Plague*  Tularemia*
Cholera*  Poliomyelitis, paralytic and non-paralytic  Typhoid fever*
Diphtheria*  Rabies  Viral hemorrhagic fever

Other Conditions
Acute illnesses or conditions of any type involving large numbers of persons in the same geographic area  Severe smallpox vaccine reaction  Other illnesses or conditions of public health significance
Illnesses or conditions suspected to be caused by the intentional or accidental release of biologic or chemical agents*  Suspected foodborne illness in two or more unrelated persons*

Infectious Diseases in Animals
Anthrax  Rabies
Plague  Tularemia

ROUTINE REPORTING OF DISEASES OR CONDITIONS

Infectious Diseases  (Report case within 24 hours to Epidemiology and Response Division by fax at 505-827-0013 or by phone at 505-827-0006; or contact the local health office)
Arboviral disease  Hansen’s Disease/Leprosy  Q fever
Brucellosis  Hantavirus pulmonary syndrome  Relapsing fever
Campylobacter infections*  Hemolytic uremic syndrome  Rocky Mountain spotted fever
Chikungunya virus disease  Hepatitis A, acute  Salmonellosis*
Clostridium difficile*  Hepatitis B, acute or chronic  Shigellosis*
Coccidiodomycosis  Hepatitis C, acute or chronic  St. Louis encephalitis infections
Colorado tick fever  Hepatitis E, acute  Streptococcus pneumoniae invasive
Cryptosporidiosis  Influenza-associated pediatric death  Tétanos*
Cysticercosis  Influenza, laboratory confirmed hospitalization  Trichinellosis
Cyclosporiasis  Legionnaires’ disease  Toxic shock syndrome
Dengue  Leptospirosis  Vancella
E. coli 0157:H7 infections*  Listeriosis*  Vibrio infections*
E. coli, shiga-toxin producing (STEC)  Lyme disease  West Nile Virus infections
Encephalitis, other  Mumps  Yersinia infections*
Giardiasis
Group A streptococcal invasive infections *  Necrotizing fasciitis*
Group B streptococcal invasive infections*  Psittacosis

Infectious Diseases in Animals  (Report case within 24 hours to Epidemiology and Response Division at 505-827-0006; or contact the local health office)
Arboviral, other  Psittacosis
Brucellosis  West Nile Virus infections

Manual for Investigation and Control of Selected Communicable Diseases  December 2018
New Mexico Department of Health, Epidemiology and Response Division,  Infectious Disease Epidemiology Bureau
**Tuberculosis**
Report suspect or confirmed cases to NM department of health tuberculosis program by fax at 505-827-0163 or by phone at 505-827-2471 or 505-827-2473: active disease within 24 hours; infection within 72 hours.

**Sexually Transmitted Diseases**
Report to Infectious Disease Bureau - STD Program, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110, Fax 505-476-3638; or call 505-476-3636.

Chancroid  
Gonorrhea  
Syphilis

*Chlamydia trachomatis* infections
**HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immunodeficiency Syndrome)**

Report to HIV and Hepatitis Epidemiology Program, 1190 St. Francis Dr., N1350, Santa Fe, NM 87502, fax 505-476-3544 or call 505-476-3515.

All CD4 lymphocyte tests (count and percent) All confirmed positive HIV (screening test plus confirmatory test) All HIV genotype tests

All positive HIV cultures All tests for HIV RNA or HIV cDNA (viral load) All tests to detect HIV proteins

Opportunistic infections, cancers, and any other test or condition HIV or AIDS

**Occupational Illness and Injury**

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

- Asbestosis
- Occupational asthma
- Silicosis
- Coal worker’s pneumoconiosis
- Occupational burn hospitalization
- Hypersensitivity pneumonitis
- Occupational injury death
- Other illnesses or injuries related to occupational exposure
- Mesothelioma
- Occupational pesticide poisoning
- Noise induced hearing loss
- Occupational traumatic amputation

**Health Conditions Related to Environmental Exposures and Certain Injuries**

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

**Environmental Exposures**

- All pesticide poisoning
- Mercury in urine greater than 3 micrograms/liter or
- Arsenic in urine greater than 50 micrograms/liter
- Mercury in blood greater than 5 micrograms/liter
- Carbon monoxide poisoning
- Uranium in urine greater than 0.2 micrograms/liter or 0.2 micrograms/gram
- Infant methemoglobinemia
- Other suspected environmentally-induced health conditions
- Lead (all blood levels)

**Injuries**

- Drug overdose
- Firearm Injuries
- Fracture due to fall among older adults
- Traumatic brain injuries

**Adverse Vaccine Reactions**

Report to Vaccine Adverse Events Reporting System, http://www.vaers.hhs.org. Send copy of report to Immunization Program Vaccine Manager, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; fax 505-827-1741.

**Healthcare-associated infections**

Acute care hospitals only report through NHSN and confer rights to NM department of health.

Central line-associated bloodstream infections (CLABSI) events

*Clostridium difficile* infections

Report all infections, including non-healthcare-associated, within 24 hours to epidemiology and response division by fax at 505-827-0013 or by phone at 505-827-0006.

- carbapenem-resistant enterobacteriaceae*
- carbapenem-resistant pseudomonas aeruginosa*

**Cancer**

Report to NM DOH designee: New Mexico Tumor Registry, University of New Mexico School of Medicine, Albuquerque, NM 87131. Report all malignant and in situ neoplasms and all intracranial neoplasms, regardless of the tissue of origin.

**Human Papillomavirus (HPV)**

Report to NM DOH designee: Laboratories report the following tests to the New Mexico HPV Pap Registry, 1816 Sigma Chi Rd NE, Albuquerque, NM 87106, phone 505-272-5785 or 505-277-0266.

- Papanicolaou test results (all results)
- Cervical, vulvar and vaginal pathology results (all results)
- HPV test results (all results)

**Birth Defects**

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.
All birth defects diagnosed by age 4 years, including:

- Defects diagnosed during pregnancy
- Defects diagnosed on fetal deaths
- Defects found in chromosome testing on amniotic fluid, chorionic villus sampling and products of conception for Trisomy 13, Trisomy 18 and Trisomy 21

**Genetic and Congenital Hearing Screening**

Report to Children’s Medical Services, 2040 S. Pacheco, Santa Fe, NM 87505; or call 505-476-8868.

- Neonatal screening for congenital hearing loss (all results)
- Suspected or confirmed congenital hearing loss in one or both ears
- All conditions identified through statewide newborn genetic screening

newborn critical congenital heart defects screenings (all results)

For details online of 7.4.3 NMAC see: [http://www.nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm](http://www.nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm)

*List of Notifiable Diseases/Conditions in New Mexico revised June 15, 2016*
APPENDIX 4: Overview of Infection Control Precautions

Adapted from:
Infection Control for the Health Care Worker Protocol, New Mexico Department of Health, Public Health Division, October 2010 Available from url:

Transmission of Infectious Agents

Microorganisms are transmitted by several routes, and the same microorganism may be transmitted by more than one route. There are five main routes of transmission: contact, droplet, airborne, common vehicle, and vector borne. For the purpose of this guideline, contact, droplet and airborne will be discussed.

(1) Contact transmission - The most important and frequent mode of transmission of healthcare-associated infections is divided into two subgroups: direct-contact transmission and indirect-contact transmission.

(a) Direct-contact transmission involves a direct body surface-to-body surface contact and physical transfer of microorganisms from one individual to another.

(b) Indirect-contact transmission involves contact of an individual with a contaminated intermediate object, usually inanimate, such as contaminated instruments, needles, or dressings, or contaminated hands that are not washed and gloves that are not changed between patients.

(2) Droplet transmission - Droplets are generated from the source person primarily during coughing, sneezing, and talking, and during the performance of certain procedures such as suctioning and bronchoscopy. Transmission occurs when droplets (i.e., small-particle residue [5 µm or smaller in size]) that contain microorganisms generated from the infected person are propelled a short distance through the air and deposited on the host's conjunctivae, nasal mucosa, or mouth, necessitating facial protection. Because droplets do not remain suspended in the air, special air handling and ventilation are not required to prevent droplet transmission; that is, droplet transmission must not be confused with airborne transmission.

(3) Airborne transmission occurs by dissemination of either airborne droplet nuclei (small-particle residue [5 µm or smaller in size] of evaporated droplets containing microorganisms that remain suspended in the air for long periods of time) or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air currents and may become inhaled by a susceptible host within the same room or over a
longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission. Microorganisms transmitted by airborne transmission include *Mycobacterium tuberculosis* and the rubeola and varicella viruses.

**Standard Precautions**

**Hand Hygiene**

Hand washing is the single most important method to prevent transmission of infectious agents. Hands should be washed:

- Before and after each patient contact.
- After exposure to blood or potentially infectious body fluid.
- Between dirty and clean procedures.
- Before putting on gloves
- Immediately after removing gloves.
- Before and after performing invasive procedures.
- After using the restroom.
- Whenever they are visibly soiled.

Routine hand washing is performed by covering the hands with soap and vigorously rubbing all surfaces of the hands for at least 20 seconds. Liquid soap in pump dispensers is recommended. Paper towels are recommended for hand drying. Alcohol-based waterless hand washing solutions are appropriate when hands are not visibly soiled. The waterless solutions are high in alcohol and can be drying to the skin. Hand lotions are recommended to prevent or minimize skin dryness and irritation, but only lotions that are not petroleum-based. When exposure to spores (e.g., *Clostridium difficile*) or norovirus is likely, hand washing with soap and water is recommended.

**Personal Protective Equipment**

Standard precautions should be used in the care of every client to prevent transmission of all infectious agents.

Gloves should be available for use by all health care personnel. Gloves should be worn when contact with blood, body fluids, secretions, excretions, items contaminated with these fluids or nonintact skin, is anticipated. Gloves do not need to be worn for routine well care. Gloves should also be changed for each blood draw. When gloves are used, hands should be washed after gloves are removed because contamination can occur during removal or from a break in the glove. Hands should be washed before donning sterile gloves. Masks, face shields, and protective eyewear should be worn if splashing of body fluids is anticipated. When soiling of clothes with blood, body fluids, secretions, or excretions is highly likely, gowns can be worn. Water impermeable gowns are needed if splashes of blood or blood-containing body fluids might occur.
Transmission-Based Precautions

Transmission-based precautions should be used for patients with proven or suspected infection with highly transmissible or pathogenic agents and are always in addition to standard precautions.

Personal protective equipment (PPE) should be put on prior to entering a patient room or contaminated area and removed prior to leaving the room or area where any of these precautions are in place.

<table>
<thead>
<tr>
<th>Type of precaution</th>
<th>Examples of conditions requiring this type of precaution</th>
<th>Isolation procedures</th>
</tr>
</thead>
</table>
| Contact            | Impetigo; infected skin lesions; infectious diarrhea; hepatitis A; *Clostridium difficile*; infection or colonization due to multi-drug resistant bacteria (e.g., methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococcus) | • Single room preferred or cohort with similar patient.  
• Patients with diarrhea need individual toilet.  
• Gloves and protective clothing for contact with exudates, infected secretions or excretions, soiled laundry. |
| Droplet            | Pneumonic plague, influenza Group A streptococcal infection, meningococcal infection; mumps, rubella, pertussis | • Single room or cohort with similar patient; keep door closed.  
• Gloves and protective clothing for contact with exudates and infected secretions.  
• Worker/visitor wears surgical mask when in room.  
• Patient wears surgical mask when out of room. |
| Airborne           | Measles, varicella, active pulmonary tuberculosis (TB), SARS | • Single room with isolated, negative-pressure airflow if possible; keep door closed.  
• Worker/visitor wears surgical mask when in room (N95 respirator for TB).  
• For vaccine preventable diseases, an immune caregiver is preferred.  
• Patient wears surgical mask when out of room.  
• Protective equipment (face shield, gown, gloves) for contact with respiratory secretions. |
I. INTRODUCTION

These guidelines are intended to assist New Mexico Department of Health (NMDOH) public health nurses (PHNs), regional nurse epidemiologists and regional epidemiologists with investigations of notifiable infections and with implementation of control measures. The guidelines provide an overview of roles and responsibilities when investigating reports of notifiable conditions or diseases and discuss regional and local office collaboration with the Epidemiology and Response Division (Central Epi). When completing any public health investigation, it is important to refer to other resources such as the ones included at the end of this document.

II. RESPONSIBILITIES

Regional and local investigators are vital to disease surveillance, outbreak detection and disease control and prevention. The investigator’s role can include:

- Assessing the risk of the case for transmitting infectious diseases to others and preventing such transmission.
- Educating people about how to reduce the risk of infection.
- Identifying other potential cases.
- Identifying outbreaks and potential sources or sites of ongoing transmission.
- Helping to characterize the epidemiology of the infectious condition.

Investigators may be any or a combination of the following, depending on the investigation:

- Nurse epidemiologist.
- Regional epidemiologist.
- Local public health nurse.
- On-call epidemiologist (Central Epi.)
- Other epidemiologists (Central Epi.)
- Disease Prevention Specialists (DPS.)
- Health Promotion Specialists.
• Other unlicensed, trained personnel as needed.

The responsibilities of local PHNs, nurse epidemiologists and regional epidemiologists may vary by NMDOH Region. In general, the nurse epidemiologist has the primary role in the region for infectious disease investigations while the regional epidemiologist has the primary role in the region for community health assessment. They may be involved in various components of the investigation depending on available resources and the acuity of the investigation. There may also be other NMDOH Divisions or agencies involved, depending on the disease and circumstance (e.g., Bureau of Health Emergency Management, New Mexico Environment Department, Division of Health Improvement).

III. PROCESSES

This section provides a general methodology for field investigations. Not all steps are necessary for every investigation. Condition-specific guidance for field investigations can be found in the Manual for Investigation and Control of Communicable Diseases in New Mexico (CD Manual). For hepatitis B and hepatitis C investigations, refer to the Hepatitis Protocol http://intranet/PHD/documents/HepatitisProtocol_November2011.pdf.

1) Initial Notification of Disease Investigation

NM Administrative Code 7.4.3.13 (cpr.state.nm.us/nmac/parts/title07/07.004.0003.htm) directs all physicians, laboratories, healthcare professionals and other persons having knowledge of specified disease or illness to report notifiable diseases or conditions to specified parties such as NMDOH Central Epi or their local/regional public health office. See Attachment A for a list of these notifiable conditions. As a result, regional and local investigators may be notified of a condition by

• The on-call Epidemiologist/Central Epi: A direct call to local or regional offices would usually be for an emergency or routine (urgent) investigation (See Glossary for definitions of emergency, routine (urgent) and routine conditions). Regions have specific procedures for responding to notifiable conditions that may differ from one another. Depending on the Region, designated staff may include the Regional Epidemiologist, Nurse Epidemiologist or other staff. For significant investigations handled only by Central Epi staff, the appropriate regional office will be notified of the investigation early in the process.

• New Mexico Electronic Disease Surveillance System (NM-EDSS): Depending on the Region, regular checking of the NM-EDSS database by a regional or local investigator will be the first notification of a routine investigation.

• A Region or local public health office may receive initial notice of a notifiable condition from a community setting (e.g., school, clinic, general public). The regional office may either:
  - Fax the report or call Central Epi to generate an investigation. A copy of the lab (if received directly from provider) should be forwarded to Central Epi.

    o Create an investigation in NM-EDSS and conduct a case interview independently.
      • This option necessitates that a Region acquire all of the pertinent demographic information and laboratory results. All new investigations
should be promptly entered into NM-EDSS in order to avoid duplicate work.

- If the initial report is of an emergency notifiable condition, regions/local public health offices must contact the epidemiologist on-call at (505)827-0006 (24/7/365) immediately.

2) Collecting Epidemiological Data

Regional and local investigators will often have to interview a case or a healthcare provider in order to collect epidemiological data:

Case Interview

Most conditions have a designated investigation form for the investigator to use during the case interview. For those conditions that do not have a specific form, use the General Infectious Disease Investigation Form. The investigation forms and a "Forms and Conditions Legend" document detailing which form to use may be accessed on the NM-EDSS portal on the “Forms” paddle (https://NM-EDSS/logon.asp). After conducting the interview, these data are entered into NM-EDSS. Investigators may also enter interview data directly into NM-EDSS during the phone interview. Any relevant information that cannot be entered into the existing data fields should be put in the General Comments field of the investigation. If the case doesn't meet the case definition, update the case status in NM-EDSS to ‘not a case’ and summarize the decision in one or two sentences in the “General Comments” section in NM-EDSS.

Although there will be situations where speaking to the case is not possible, please always attempt to speak with the actual case if s/he is an adult. For cases less than 18 years old, interview the parent or guardian. However, you may consider simultaneously interviewing the parent and child – the child may have more information, for example of what s/he ate during school or with friends.

Depending on the complexity of the investigation, multiple calls to the case or provider may be required. In such cases, remind the case or provider that you may need to call again with additional questions or recommendations.

Cases who live on tribal reservations or lands should be referred to Central Epi to determine which tribal investigator needs to be contacted to investigate. Cases who live outside of New Mexico should also be referred to Central Epi.

Provider Interview

In general, providers are contacted for most “emergency” and “routine (urgent)” conditions and some “routine” conditions. Central Epi and field investigators will determine when provider interviews are necessary. Central Epi often conducts the provider interviews to:

- Gain additional information (e.g., case identifiers, lab/diagnostic results.)
- Obtain their clinical impressions.
- Determine if field investigation is indicated.
- Inform them we are going to contact their patient/case.

Field investigators may also call providers to:

- Determine if the case is aware of the diagnosis.
- Obtain additional information (e.g., vaccine history, social history.)
Let the provider know that NMDOH will be contacting the patient/case for an interview. Sometimes, providers prefer to contact the patient/case first, in order to alert their patient/case of the diagnosis and that NMDOH is involved.

Be aware that for some “routine” conditions, where provider interviews are not commonly recommended (e.g., salmonellosis), the investigator may be the first one to inform a case of a lab result. This may occur because DOH receives the report sooner than the provider or because a patient/case is evaluated in a setting (e.g., urgent care) where providers do not typically follow patients’/cases’ results. In such circumstances, it may be helpful to explain to the case how labs are reported and the important role public health plays in helping prevent further transmission. If a case has questions about his or her individual treatment, encourage them to contact their provider.

Even after interviewing the case, the investigator may deem it necessary to contact the provider. If the investigator is uncertain about whether or not to contact a provider, consult with Central Epi. For example, if a symptomatic child who attends daycare has shigellosis and was not prescribed antibiotics, the investigator may decide to contact the provider. The investigator could discuss with the provider the need to exclude the child from daycare until s/he has had two negative stool cultures, and therefore ask the provider if s/he is considering antibiotic treatment for the child.

New Mexico State Immunization Information System (NMSIIS)

For vaccine-preventable diseases and conditions, investigators should always ask about vaccine status. NMSIIS (https://nmsiis.health.state.nm.us) is a person-based vaccination registry that investigators may use to check vaccine status. Vaccinations relevant to the investigation should be entered into NM-EDSS and associated with the investigation.

Emergency and Routine (Urgent) Conditions versus Routine Conditions

Tables 1 and 2 (below) outline an investigator’s response to conditions requiring emergency, routine (urgent) and routine investigations. Routine (Urgent) conditions require the same rapid response as Emergency conditions. Although these are not listed as emergencies on the notifiable condition list, they should be regarded as an emergency in terms of response. At a minimum, field investigators should assure they are following the number of attempts outlined here and maintain a reasonable time frame to complete the investigation. The exact time frame for initiating certain steps within these procedures may vary, depending on a Region’s preference and experience. Attempts to contact a case or provider for an interview should always be documented in the “General Comments” section of the investigation in NM-EDSS.

Investigators should enter the date they start the investigation by placing the date of initiation under “Investigation Start Date” under the “Investigation Summary” section in NM-EDSS. Date of initiation captures when they begin attempting to contact the case, not necessarily when they actually succeed in contacting the case.
Table 1. Guidelines for Responding to Emergency and Routine (Urgent) Conditions

<table>
<thead>
<tr>
<th>Emergency and Routine (Urgent) Conditions</th>
</tr>
</thead>
</table>
| Time Frame to Initiate Investigation     | Within 15 minutes  
| Procedures for Contacting Case          |  
|   1. The investigator attempts to contact the case by telephone. If the case is not available, try to gather more information from the person answering the phone about the case’s location or leave a vague but urgent message (e.g., “We are following up on an important public health issue and need to speak with X as soon as possible.”)  
|   2. If unable to establish contact, investigator calls the provider, facility, laboratory, and others to obtain additional contact information (e.g., cell phone or emergency contact) and reattempts to contact the case.  
|   3. If unable to contact the person after 2 hours of initiating the investigation, consult with on-call Epi to determine other possible courses of action. In planning the next steps, consideration will be given to the case’s condition and the history of attempts to contact case. The afterhours Epi on-call will consider whether to continue to reach the case.  
|   4. An investigator may be asked to visit a home or hospital. In these instances, if the case is not home or available at the hospital, the investigator leaves a notification on either the door or with other resident of home/staff of the medical facility. |

Table 2. Guidelines for Responding to Routine Conditions

<table>
<thead>
<tr>
<th>Routine Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Frame to Initiate Investigation</td>
</tr>
</tbody>
</table>
# Procedures for Contacting the Case

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The investigator makes <em>at least</em> 3 attempts to contact the case by phone over a 72 hr period (working days).</td>
</tr>
<tr>
<td>2.</td>
<td>If case cannot be reached by phone after 72 hrs, a certified notification letter (see Attachment B) is sent to the case’s home address.</td>
</tr>
<tr>
<td>3.</td>
<td>If the case does not respond to the initial letter within one week* of its mailing, a 2nd letter is sent.</td>
</tr>
<tr>
<td>4.</td>
<td>If the case does not respond to the 2nd letter within one week of mailing, the case is closed and marked as “Lost to Follow-up” in the “General Comments” section of the investigation in NM-EDSS. Document in the “General Comments” section all attempts to contact the person prior to determining the case is “lost to follow-up”.</td>
</tr>
<tr>
<td>5.</td>
<td>If case responds after the case has been closed, the Investigator will re-open the file to conduct the investigation.</td>
</tr>
</tbody>
</table>

* A week is defined as the time period of 7 calendar days. For example, if the report was received on a Wednesday, the investigator has until the following Wednesday to complete the procedures for that step.

## 3) Confirming the Diagnosis and Sample Collection

Condition specific criteria for confirming the diagnosis and determining case status can be found in the Manual for Investigation and Control of Communicable Diseases in New Mexico (CD Manual). Keep in mind that epidemiological case definitions may differ from clinical case definitions.

Confirming the diagnosis may require the field investigator to assure specimen collection:

- **Field investigators may need to take multiple specimens (e.g. in a group setting) or multiple types of samples (e.g. blood, vomitus, stool, etc.).** For specifics by condition, consult the CD Manual.

  Before specimen collection, field investigators should be up to date on blood-borne pathogens training and adhere to appropriate safety precautions (e.g., contact respiratory or airborne precautions, depending on the pathogen). Refer to [http://intranet/PHD/documents/PHDHealthandSafetyHandbook3.5_112011_000.pdf](http://intranet/PHD/documents/PHDHealthandSafetyHandbook3.5_112011_000.pdf) and [http://intranet/PHD/documents/PHD_Infection_Control_HCW_v3.0_11112011.pdf](http://intranet/PHD/documents/PHD_Infection_Control_HCW_v3.0_11112011.pdf) for current PHD PPE and Health and Safety guidelines.

- **Supplies in local NMDOH Public Health Division (PHD) public health offices will be stocked depending on regional circumstances.** Supplies may be ordered through the NMDOH Scientific Laboratory Division (SLD) kit prep area at (505) 383-9073 or (505) 383-9056, or orders may be faxed to (505) 383-9062. In an outbreak situation, regional or local health offices may not have appropriate collection materials available. If an investigator needs more testing supplies, it may be necessary to contact a regional hospital for additional response supplies. See Attachment C for a list of commonly used supplies for field investigation and sample collection.
• Coordinate with Central Epi, New Mexico Environment Department (NMED) or other appropriate environment departments (e.g., Bernalillo County Environmental Health Department, the Albuquerque Environmental Health Department, the Indian Health Service [IHS] environmental sanitarians) and SLD for all food sample collections.

• Coordinate with the on-call Epi before collecting specimens related to outbreak investigations.

4) Control and Prevention Measures

Educating the case/provider of control and prevention measures

During investigations, educating the cases, contacts or providers is the only control and prevention measure required. Be prepared to provide information about the condition and how it is transmitted, diagnosed, treated and prevented. See the disease-specific fact sheets in the CD Manual for more information. Also, be prepared to explain the role of NMDOH in disease surveillance, investigation and control measures. See Administrative Code 7.4.3.9 (nmcp_r.state.nm.us/nmac/parts/title07/07.004.0003.htm) for legal authority of NMDOH to protect public health. Refer all calls from the media either to the Public Information Officer or the on-call Epi. Central Epi and regional staff are available if additional questions arise during the investigation. All new educational materials should be approved by ERD leadership.

Contact investigation

The investigator interviews the case to determine if there are individuals who may be at risk for becoming infected with the disease based on their proximity to and time spent with the case. Refer to the CD Manual for additional disease-specific guidance on investigating contacts. In certain situations, cases or contacts may need prescriptions. During a public health event where immediate action is required to prevent further transmission of disease, DOH providers may write the prescription if an individual does not have timely access to health care.

Follow-up with cases in group settings

Potential group settings include, daycare centers, healthcare facilities and schools and other settings. Follow-up for cases in group settings may be complicated and investigators should refer to the CD Manual and consult with regional staff and Central Epi for specific steps. Depending on the condition and setting, other agencies may need to be involved. For example, investigators should work with the New Mexico Environment Department regarding kitchen and restaurant inspections. See Attachment D for contact information of collaborating agencies.

Investigators may also conduct site visits to coordinate prevention and control measures at group settings. It is important to maintain confidentiality and communicate information on a need-to-know basis. In certain settings (e.g., daycares and schools), letters may be developed to communicate disease information and recommendations. Central, regional and local staff should always be notified of any communication before distribution.

Jails and prisons pose special challenges. Work with the facility medical staff when possible.

Enterics in daycare settings require on-site inspection if there is more than one case in the setting. If resources allow, visitation to the daycare center to conduct surveillance and reinforce recommendations and prevention messages may be useful with even a single case. See Attachment E for a sample inspection form. New Mexico Children, Youth and Families Department (CYFD) licensing should be notified by NM DOH as necessary of any communicable disease investigations in a day care setting.

Outbreaks
In an outbreak, investigators may be required to address additional aspects of the investigation. A line list is often used to organize information, track cases and contacts for follow-up and communicate efficiently. It may include symptomatic and asymptomatic persons. Line lists contain protected case and contact information and should be emailed using internal encryption and not shared with other agencies unless case identifiers (including date of birth, sex and other potentially identifying information) are removed. Line lists are also the source for data on outbreaks, archived and required by Central Epi. Methods for sending line lists with protected health information (PHI) include a shared “FileZilla” site and the protected shared “nurseforms\X Drive” accessible by public health offices. See Attachment F for a sample line list.

All outbreaks will require coordination with Central Epi. All official communication to the public regarding outbreaks should go through the Public Information Officer. For more details on how to conduct outbreak investigations, consult with Central Epi.

5) Closing Out/Completing a Case Investigation

Once all prevention and control measures and interviews are complete, field investigators should ensure the following steps are finished:

- The case investigation has been entered in NM-EDSS
- Name, date of birth, sex, address, phone number, county and state have been completed on “Demographics” tab, and onset or diagnosis date has been entered
- The “Investigation Status” is changed from “open” to “closed” in NM-EDSS
- A notification has been submitted in NM-EDSS
- Assure that a copy of the lab (if received directly from provider) has been forwarded to Central Epi

IV. COLLABORATION BETWEEN REGIONAL AND CENTRAL EPI

The following section describes the collaborative responsibilities and investigation requirements for notifiable infectious conditions other than tuberculosis, sexually transmitted infections, and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS). For tuberculosis, sexually transmitted infections and HIV/AIDS reporting, see Public Health Division (PHD) protocols on the PHD intranet.

The following notifiable infectious conditions are summarized in Tables 3-8 and organized by the following program areas:

- Foodborne Diseases Program (Table 3)
- General Infectious Disease Program
  - Vaccine Preventable Diseases (Table 4)
  - Zoonotic Diseases (Table 5)
  - Other (Table 6)
- Bacterial Meningitis Invasive Respiratory Disease Program/Emerging Infections Program (Table 7)
- Hepatitis Program (Table 8) note: Hepatitis A and hepatitis E have been separated from the bloodborne viral hepatitis diseases and are found in the “General Infectious Diseases Program.”

See Glossary for definitions of the terms used in Tables 3-8.
Table 3. Foodborne Diseases Program

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botulism, foodborne</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview – Central or Region</td>
</tr>
<tr>
<td>Campylobacteriosis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Cholera</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation - Central or Region</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Cyclosporiasis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td><em>E. coli</em> O157:H7 infections</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td><em>E. coli</em>, shiga-toxin producing (STEC) infections</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Central or Region</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Trichinosis</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Typhoid Fever</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation</td>
</tr>
<tr>
<td>Vibrio Infections</td>
<td>Yes</td>
<td>Central-Regional Collaboration</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Central or Region</td>
</tr>
<tr>
<td><em>Yersinia enterocolitica</em></td>
<td>Yes</td>
<td>Central-Regional Collaboration</td>
<td>Routine</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
</tbody>
</table>
Table 4. General Infectious Diseases Program – Vaccine Preventable Diseases

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria</td>
<td>Yes</td>
<td>Central</td>
<td>Emergency</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Hepatitis A - Acute</td>
<td>Yes</td>
<td>Central-Region</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Measles</td>
<td>Yes</td>
<td>Central-Region</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Mumps</td>
<td>Yes</td>
<td>Central-Region</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Region Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Yes</td>
<td>Central-Region</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Rubella, including congenital</td>
<td>Yes</td>
<td>Central-Region</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Tetanus</td>
<td>Yes</td>
<td>Central</td>
<td>Routine (Urgent)</td>
<td>Provider Interview Case Interview</td>
</tr>
<tr>
<td>Varicella</td>
<td>Yes</td>
<td>Region</td>
<td>Routine</td>
<td>Provider Interview Case Interview</td>
</tr>
</tbody>
</table>
### Table 5. General Infectious Diseases Program – Zoonoses

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
</table>
| Anthrax (human)                   | Yes                 | Central        | Emergency       | Provider Interview  
Case Interview  
Contact Investigation  
Contact Prophylaxis |
| Arbovirus (Dengue, Zika, Chikungunya) | Yes                 | Central        | Routine         | Provider Interview  
Case Interview |
| Avian Influenza (human)           | Yes                 | Central        | Emergency       | Provider Interview  
Case Interview  
Contact Investigation  
Contact Prophylaxis |
| Brucellosis                       | Yes                 | Central-Region Collaboration | Routine (Urgent) | Provider Interview-Central  
Case Interview-Central  
Contact Investigation-Central/Region |
| Colorado Tick Fever               | Yes                 | Central        | Routine         | Provider Interview |
| Hantavirus pulmonary syndrome     | Yes                 | Central        | Routine (Urgent) | Provider Interview  
Case Interview  
Zoonotic Investigation |
| Leptospirosis                     | Yes                 | Central        | Routine         | Provider Interview  
Case Interview |
| Lyme Disease                      | Yes                 | Central        | Routine         | Provider Interview |
| Malaria                           | Yes                 | Central        | Routine         | Provider Interview  
Case Interview as needed |
| Plague                            | Yes                 | Central        | Emergency       | Provider Interview  
Case Interview  
Zoonotic Investigation |
| Psittacosis                       | Yes                 | Central        | Routine         | Provider Interview |
| Q fever                           | Yes                 | Central        | Routine         | Provider Interview |
| St. Louis Encephalitis            | Yes                 | Central        | Routine         | Provider Interview  
Case Interview |
| Rabies                            | Yes                 | Central-Region Collaboration | Emergency       | Provider Interview-Central  
Case Interview-Central  
Prophylaxis-Central/region |
| Relapsing Fever                   | Yes                 | Central        | Routine         | Provider Interview  
Case Interview  
Zoonotic Investigation |
| Rocky Mountain Spotted Fever      | Yes                 | Central        | Routine         | Provider Interview  
Case Interview |
| Tularemia (human)                 | Yes                 | Central        | Emergency       | Provider Interview  
Case Interview  
Zoonotic Investigation |
| West Nile Virus                   | Yes                 | Central-Region Collaboration | Routine         | Provider Interview-Central  
Case Interview-Central/region |
<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Equine Encephalitis</td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview</td>
</tr>
<tr>
<td>Yellow fever</td>
<td>Yes</td>
<td>Central</td>
<td>Emergency</td>
<td>Provider Interview</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Case Interview</td>
</tr>
<tr>
<td>Botulism, infant</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Central or Region</td>
</tr>
<tr>
<td>Botulism, wound</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview – Central or Region</td>
</tr>
<tr>
<td>Coccidioidomycosis (Valley Fever)</td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Medical Record Review or Provider Interview</td>
</tr>
<tr>
<td>Cysticercosis</td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Case Interview</td>
</tr>
<tr>
<td>Encephalitis, other</td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview</td>
</tr>
<tr>
<td>Hemolytic uremic syndrome (HUS),</td>
<td>Yes</td>
<td>Central</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Emerging Infection Program Chart Review</td>
</tr>
<tr>
<td>post diarrheal</td>
<td></td>
<td></td>
<td></td>
<td>Influenza Sentinel Surveillance Program Review</td>
</tr>
<tr>
<td>Hepatitis E</td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Influenza, laboratory confirmed</td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Legionnaire’s disease</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Routine (Urgent)</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Leprosy (Hansen’s Disease)</td>
<td>Yes</td>
<td>TB Program¹</td>
<td>Routine</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Poliomyelitis, paralytic</td>
<td>Yes</td>
<td>Central</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Severe Acute Respiratory Syndrome (SARS)</td>
<td>Yes</td>
<td>Central</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Yes</td>
<td>Central</td>
<td>Emergency</td>
<td>Provider Interview - Central Case Interview - Region</td>
</tr>
<tr>
<td>Toxic Shock Syndrome</td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Emerging Infection Program - Emerging Infection Program Chart Review</td>
</tr>
</tbody>
</table>

¹Although Leprosy is currently listed with infectious diseases that are monitored by the Infectious Disease Epidemiology Bureau on the “Notifiable Diseases or Conditions in New Mexico”, it is a nontuberculous mycobacterial infection and therefore under the purview of the Tuberculosis Program.
### Table 7. Bacterial Meningitis Invasive Respiratory Disease Program/Emerging Infections Program.

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong> Streptococcus, invasive infections</td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Emerging Infections Program Chart Review</td>
</tr>
<tr>
<td><strong>Group B</strong> Streptococcus, invasive infections</td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Emerging Infections Program Chart Review</td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em>, invasive infections</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Only if <em>Haemophilus influenzae</em> type b: Case Interview – Region Provider Interview – Central Contact Investigation Contact Prophylaxis- Region/Central If not type b: Emerging Infections Program Chart Review</td>
</tr>
<tr>
<td>Meningococcal infections, invasive ( (<em>Neisseria meningitidis</em>))</td>
<td>Yes</td>
<td>Central-Region Collaboration</td>
<td>Emergency</td>
<td>Case Interview – Region Provider Interview – Central Contact Investigation- Region Contact Prophylaxis- Region</td>
</tr>
<tr>
<td><strong>Streptococcus pneumoniae</strong>, invasive infections</td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Emerging Infections Program Chart Review</td>
</tr>
<tr>
<td><strong>Necrotizing Fasciitis</strong></td>
<td>No</td>
<td>Central</td>
<td>Routine</td>
<td>Emerging Infections Program Chart Review</td>
</tr>
</tbody>
</table>
Table 8. Hepatitis Program

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B - acute</td>
<td>Yes</td>
<td>Check with Regional Leadership</td>
<td>Routine</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Hepatitis B - chronic</td>
<td>Yes</td>
<td>Check with Regional Leadership</td>
<td>Routine</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Hepatitis B – perinatal</td>
<td>Yes</td>
<td>Check with Regional Leadership</td>
<td>Routine</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td>Hepatitis C - acute</td>
<td>Yes</td>
<td>Check with Regional Leadership</td>
<td>Routine</td>
<td>Provider Interview Case Interview</td>
</tr>
<tr>
<td>Hepatitis C – chronic</td>
<td>Yes</td>
<td>Check with Regional Leadership</td>
<td>Routine</td>
<td>Provider Interview Case Interview</td>
</tr>
</tbody>
</table>

Table 9. Healthcare Associated Infections

<table>
<thead>
<tr>
<th>Disease/Condition</th>
<th>Case Investigation?</th>
<th>Responsibility</th>
<th>Response Time</th>
<th>Type of Follow-up or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbapenem Resistant Enterobacteriaceae</td>
<td>Yes</td>
<td>Central</td>
<td>Routine (Urgent)</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td><em>Clostridium difficile</em></td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Yes</td>
<td>Central</td>
<td>Routine</td>
<td>Provider Interview Case Interview Contact Investigation Contact Prophylaxis</td>
</tr>
</tbody>
</table>

V. GLOSSARY OF TERMS

Case Investigation is the process of gathering data on an individual reported to have a specific condition. Of note, some information (e.g., demographic data) is relatively common across case investigations, while other information (e.g., immunization history, food history) varies by condition. Although a case may not require individual case follow-up (or an investigation), a notifiable condition still requires reporting and subsequent entry into NM-EDSS. Reports of
notifiable conditions (for example, Hepatitis C or outbreaks) that do not require individual case investigation should be forwarded to Central Epi for follow-up.

**Central/Central Epi** refers to the Infectious Disease Epidemiology Bureau within the Epidemiology and Response Division in NMDOH.

**Central-Region Collaboration** denotes collaboration between Central Epi and Region to investigate the disease.

**Contact Prophylaxis** refers to measures taken to prevent disease in contacts, such as chemoprophylaxis and/or vaccination.

**Emergency** refers to notifiable conditions that require immediate reporting by telephone to Central Epi. The “Notifiable Diseases or Conditions in New Mexico” list divides the reportable conditions into two categories: (1) “emergency” or (2) “routine.” See Table 1 for appropriate response for emergency conditions.

**Epidemiology** is the study of the distribution and patterns of health-events, health-characteristics and their causes or influences in well-defined populations.

**Local** refers to local public health offices. Each county has one or more local public health offices. See [http://nmhealth.org/location/public/](http://nmhealth.org/location/public/) for a listing of all NMDOH local public health offices.

**New Mexico Electronic Disease Surveillance System (NM-EDSS)** is a web-based system used by public health staff throughout the state to track investigations of suspect, probable, and confirmed cases of notifiable infectious diseases. NM-EDSS is modified from the CDC National Electronic Disease Surveillance System (NEDSS). Notifiable conditions are reported to CDC through NM-EDSS.

**Notifiable Conditions** are diseases, infections and conditions listed in NM Administrative Code 7.4.3.13 ([nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm](http://nmcpr.state.nm.us/nmac/parts/title07/07.004.0003.htm)) This Code requires all physicians, laboratories, health care professionals, and other persons having knowledge of an individual with a notifiable condition to report the individual to the Epidemiology and Response Division or their local/regional public health office. Of note, any known or suspected outbreak is notifiable, even if it is a condition where a single case would not normally be notifiable.

**Region** refers to the administrative units used by NMDOH Public Health Division and Epidemiology and Response Division. There are four regions in New Mexico, and each is a collection of one or more counties. There is one administrative office for each of the regions. See Attachment G for a map of the regions.

**Responsibility** refers to whether the Region or Central Epi office should have the primary responsibility in the follow-up of a particular disease. However, even if a disease is marked as “Region”, please feel free to contact Central if questions arise at any time during the investigation. Even in cases marked ‘Central’ there may be Central-Region collaboration (example: coordinating sample submission for rabies).

**Routine** refers to notifiable conditions that require reporting within 24 hours to Central Epi. The “Notifiable Diseases or Conditions in New Mexico” list divides the reportable conditions into two categories: (1) “emergency” or (2) “routine.” See Table 2 for appropriate response time for routine conditions.

**Routine (Urgent)** refers to routine conditions that are regarded as more urgent due to potential impact on the public’s health. Therefore “routine (urgent)” designates a disease that is not listed as emergency on the notifiable condition list but should be regarded as emergency in terms of response. See Table 1 for appropriate response times for routine (urgent) conditions.
Zoonoses are infectious diseases in animals that can be transmitted to people. The natural reservoir for the infectious agent is an animal. Zoonotic investigations are conducted by Central Epi.

VI. References

The following are good resources when conducting an investigation:

4. Center for Disease Control and Prevention website (www.cdc.gov)
8. NM School Health Manual (nmschoolhealthmanual.org)
9. NM Department of Health Go-kit manual

VII. Attachments

Attachment A: Notifiable Conditions List
Attachment B: Sample Contact Letter
Attachment C: Investigation Supplies
Attachment D: Important Numbers
Attachment E: Sample Day Care Inspection Form
Attachment F: Sample Line List (GI Illness)
Attachment G: Map of DOH Regions
Attachment H: Clinical Protocol/Manual Approval Sheet
Attachment I: ACKNOWLEDGEMENT AND RECEIPT OF NEW/REVISED CLINICAL PROTOCOL
Attachment A: Notifiable Conditions List

NOTIFIABLE DISEASES OR CONDITIONS IN NEW MEXICO
7.4.3.13 NEW MEXICO ADMINISTRATIVE CODE

ALL REPORTS INCLUDING ELECTRONIC LABORATORY REPORTS OF NOTIFIABLE CONDITIONS MUST INCLUDE:

1. The disease or condition being reported;
2. Patient's name, date of birth/age, gender, race/ethnicity, address, patient’s telephone numbers, and occupation;
3. Physician or licensed healthcare professional name and telephone number; and
4. Healthcare facility or laboratory name and telephone number, if applicable.

Laboratory or clinical samples for conditions marked with [*] are required to be sent to the Scientific Laboratory Division.

EMERGENCY REPORTING OF DISEASES OR CONDITIONS

The following diseases, confirmed or suspected, require immediate reporting by telephone to Epidemiology and Response Division at 505-827-0006. If no answer, call 1-866-885-6485.

**Infectious Diseases**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax*</td>
<td>Haemophilus influenzae invasive infections*</td>
</tr>
<tr>
<td>Avian or novel influenza*</td>
<td>Rubella (including congenital)</td>
</tr>
<tr>
<td>Bordetella species*</td>
<td>Severe Acute Respiratory Syndrome (SARS)*</td>
</tr>
<tr>
<td>Botulism (any type)*</td>
<td>Smallpox*</td>
</tr>
<tr>
<td>Cholera*</td>
<td>Tularemia*</td>
</tr>
<tr>
<td>Diphtheria*</td>
<td>Typhoid fever*</td>
</tr>
<tr>
<td></td>
<td>Yellow fever</td>
</tr>
</tbody>
</table>

**Other Conditions**

- Acute illnesses or conditions of any type involving large numbers of persons in the same geographic area
- Severe smallpox vaccine reaction
- Other illnesses or conditions of public health significance

- Illnesses or conditions suspected to be caused by the intentional or accidental release of biologic or chemical agents*
- Suspected foodborne illness in two or more unrelated persons*
- Suspected waterborne illness or conditions in two or more unrelated persons*

**Infectious Diseases in Animals**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax</td>
<td>Rabies</td>
</tr>
<tr>
<td>Plague</td>
<td>Tularemia</td>
</tr>
</tbody>
</table>

**Routine Reporting of Diseases or Conditions**

**Infectious Diseases** (Report case within 24 hours to Epidemiology and Response Division at 505-827-0006; or contact the local health office)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucellosis</td>
<td>Hemolytic uremic syndrome</td>
</tr>
<tr>
<td><em>Campylobacter</em> infections*</td>
<td>Rocky Mountain spotted fever</td>
</tr>
<tr>
<td><em>Clostridium difficile</em></td>
<td>Salmonellosis*</td>
</tr>
<tr>
<td>Coccidioidomycosis</td>
<td>Shigellosis*</td>
</tr>
<tr>
<td>Colorado tick fever</td>
<td>St. Louis encephalitis infections</td>
</tr>
<tr>
<td>Cryptosporidiosis</td>
<td><em>Streptococcus pneumoniae invasive</em></td>
</tr>
<tr>
<td>Cysticercosis</td>
<td>Tetanus</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manual for Investigation and Control of Selected Communicable Diseases
New Mexico Department of Health, Epidemiology and Response Division,
Infectious Disease Epidemiology Bureau

December 2018
Page 17 of 35
### Attachment A: Notifiable Conditions List

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclosporiasis</td>
<td>Legionnaires' disease</td>
<td>Trichinellosis</td>
</tr>
<tr>
<td>Dengue</td>
<td>Leptospirosis</td>
<td>Toxic shock syndrome</td>
</tr>
<tr>
<td><em>E. coli</em> 0157:H7 infections*</td>
<td>Listeriosis*</td>
<td>Varicella</td>
</tr>
<tr>
<td><em>E. coli</em>, shiga-toxin producing (STEC)</td>
<td>Lyme disease</td>
<td><em>Vibrio</em> infections*</td>
</tr>
<tr>
<td>Encephalitis, other</td>
<td>Malaria</td>
<td>West Nile Virus infections</td>
</tr>
<tr>
<td>Giardiasis</td>
<td>Mumps</td>
<td>Western equine encephalitis infections</td>
</tr>
<tr>
<td>Group A streptococcal invasive infections*</td>
<td>Necrotizing fasciitis*</td>
<td><em>Yersinia</em> infections*</td>
</tr>
<tr>
<td>Group B streptococcal invasive infections*</td>
<td>Psittacosis</td>
<td></td>
</tr>
<tr>
<td>Hantavirus pulmonary syndrome</td>
<td>Q fever</td>
<td></td>
</tr>
</tbody>
</table>

**Infectious Diseases in Animals** (Report case within 24 hours to Epidemiology and Response Division at 505-827-0006; or contact the local health office).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arboviral, other</td>
<td>Psittacosis</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>West Nile Virus infections</td>
</tr>
</tbody>
</table>

**Tuberculosis* or Other Nontuberculous Mycobacterial Infections** (including *Mycobacterium avium* complex or leprosy)

Report suspect or confirmed cases within 24 hours to Tuberculosis Program, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-2473.

**Sexually Transmitted Diseases**

Report to Infectious Disease Bureau - STD Program, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110, Fax 505-476-3638; or call 505-476-3636.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chancroid</td>
<td>Gonorrhea</td>
<td>Syphilis</td>
</tr>
<tr>
<td><em>Chlamydia trachomatis</em> infections</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Attachment A: Notifiable Conditions List

HIV (Human Immunodeficiency Virus) and AIDS (Acquired Immunodeficiency Syndrome)

Report to HIV and Hepatitis Epidemiology Program, 1190 St. Francis Dr., N1350, Santa Fe, NM 87502, fax 505-476-3544 or call 505-476-3515.

- All CD4 lymphocyte tests (count and percent)
- All confirmed positive HIV antibody tests (screening test plus confirmatory test)
- All HIV genotype tests
- All positive HIV cultures
- All tests for HIV RNA or HIV cDNA (viral load tests)
- All tests to detect HIV proteins
- Opportunistic infections, cancers, and any other test or condition indicative of HIV or AIDS

Occupational Illness and Injury

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

- Asbestosis
- Coal worker’s pneumoconiosis
- Hypersensitivity pneumonitis
- Mesothelioma
- Noise induced hearing loss
- Occupational asthma
- Occupational burn hospitalization
- Occupational injury death
- Occupational pesticide poisoning
- Occupational traumatic amputation
- Silicosis
- Other illnesses or injuries related to occupational exposure

Health Conditions Related to Environmental Exposures and Certain Injuries

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

- Environmental Exposures
  - All pesticide poisoning
  - Arsenic in urine greater than 50 micrograms/liter
  - Carbon monoxide poisoning
  - Infant methemoglobinemia
  - Lead (all blood levels)
  - Mercury in urine greater than 3 micrograms/liter or 5 micrograms/gram creatinine
  - Uranium in urine greater than 0.2 micrograms/liter or 0.2 micrograms/gram creatinine
  - Other suspected environmentally-induced health conditions

- Injuries
  - Drug overdose
  - Firearm Injuries
  - Traumatic brain injuries

Adverse Vaccine Reactions

Report to Vaccine Adverse Events Reporting System, http://www.vaers.hhs.org. Send copy of report to Immunization Program Vaccine Manager, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; fax 505-827-1741.

Healthcare-associated infections

- Central line-associated bloodstream infections (CLABSI) events
- Clostridium difficile infections

Cancer

Report to NM DOH designee: New Mexico Tumor Registry, University of New Mexico School of Medicine, Albuquerque, NM 87131. Report all malignant and in situ neoplasms and all intracranial neoplasms, regardless of the tissue of origin.

Human Papillomavirus (HPV)
Attachment A: Notifiable Conditions List

Report to NM DOH designee: Laboratories report the following tests to the New Mexico HPV Pap Registry, 1816 Sigma Chi Rd NE, Albuquerque, NM 87106, phone 505-272-5785 or 505-277-0266.

Papanicolaou test results (all results)  Cervical, vulvar and vaginal pathology results (all results)  HPV test results (all results)

**Birth Defects**

Report to Epidemiology and Response Division, NM Department of Health, P.O. Box 26110, Santa Fe, NM 87502-6110; or call 505-827-0006.

All birth defects diagnosed by age 4 years, including:
Defects diagnosed during pregnancy
Defects diagnosed on fetal deaths

- Defects found in chromosome testing on amniotic fluid, chorionic villus sampling and products of conception for Trisomy 13, Trisomy 18 and Trisomy 21

**Genetic and Congenital Hearing Screening**

Report to Children’s Medical Services, 2040 S. Pacheco, Santa Fe, NM 87505; or call 505-476-8868.

Neonatal screening for congenital hearing loss (all results)  Suspected or confirmed congenital hearing loss in one or both ears  All conditions identified through statewide newborn genetic screening
Attachment B: Sample Contact Letter

<Client Name>
<Address>
<City and Zip code>

<Date>

Dear <Mr. or Ms. Case Name>:
Please call the <Public Health Office> at <phone number> as soon as possible. It is important we speak to you, but it is NOT an emergency. If you receive this letter on a weekend or holiday, just call us the following workday.
Office hours are 8:00 AM to 5:00 PM Monday through Friday. Thank you for your time and cooperation.

Por favor, llame a la <Public Health Office> a <phone number> lo más pronto posible.
Es importante que hablemos con usted, pero NO es una emergencia. Si usted recibe esta carta en un fin de semana o un día de vacación, por favor llámenos el próximo día laboral.
Las horas de la oficina son 8:00am a 5:00pm lunes a viernes. Muchas gracias por su tiempo y cooperación.

{Name of sender>
>Title>
<Phone number>
Attachment C: Go-kit Investigation Supplies

In an emergency situation or on short notice, a public health office should have the appropriate supplies to initiate epidemiological activities in a field setting. This checklist includes supplies associated with investigation activities: case investigation, contact tracing, and laboratory testing activities. Specific supplies needed may vary depending on the type of disease outbreak. Expiration dates should be checked regularly. Some supplies may be pre-assembled in Go-Kits, ready-to-go packs that allow for quick and easy access to the necessary field equipment and supplies. The go-kit supplies are carried in a rolling expanded briefcase.

General Supplies
- Gloves
- Biohazard sharps container
- Pens / Clipboards
- Notebook / Notepad
- Business cards
- Tissues
- Biohazard bags
- Table paper/tape
- Hand sanitizer
- Surgical masks

Enteric
- Styrofoam cooler for post-collection
- Frozen ice packs (3-4) inside cooler
- Enteric Module
- Norovirus Module (if testing to rule out norovirus)

Forms
- Disease fact sheets: campylobacter, cryptosporidium, shigella, salmonella, STEC
- Instructions for collecting stool specimen (EM and EM & NoV if testing to rule out noro)
- GI Illness Line List
- SLD General Clinical Request Form (for enteric testing)
- SLD General Clinical Request Form (for norovirus testing, if testing to rule out norovirus)
- SLD General Clinical Request Form (blank)
- Stool Specimen and Enteric Organism Transport (from CD Manual)

Hepatitis A
- Styrofoam cooler
- Frozen ice packs (3-4) inside cooler
- Vaccine
- Vaccine Module
- Phlebotomy Module

**Forms**

- Hepatitis A Fact Sheet
- Hepatitis A VIS
- Treatment of Epidemiology Cases or Contacts Form
- Adult Vaccine Consent Form
- NM VFC Vaccine Administration Form
- HIPAA policy and acknowledgement form
- SLD General Clinical Request Form (blank)

**Respiratory/Influenza-like Illness (ILI)**

- Styrofoam cooler for post-collection
- Second cooler for vaccine
- Frozen ice packs (3-4) inside cooler
- Viral Respiratory Kit
- Vaccine
- Vaccine Module

**Forms**

- Respiratory/ILI Line List
- Influenza Fact Sheet
- Influenza VIS
- HIPAA policy and acknowledgement form
- SLD General Clinical Request Form
- SLD Form: Collection and Transport of a Viral Sample
- Adult Flu Vaccine Consent Form
- NM VFC Vaccine Administration Form
- Treatment of Epidemiology Cases or Contacts form

**Meningococcal**

**Additional Supplies**

- Styrofoam cooler
- Frozen ice packs (3-4) inside cooler
- Water (if none available)
- Medication (Ceftriaxone, Rifampin, and/or Ciprofloxacin depending on situation)
- Vaccine
- Vaccine Module
- Oral Medication Administration Module

**Forms**
- 2008 CD Manual chemoprophylaxis section
- 2013 CD Manual Meningococcal Disease section
- Ceftriaxone/Rocephin education sheets
- Rifampin education sheets
- Ciprofloxacin education sheets
- Treatment of Epidemiology Cases or Contacts form
- Meningococcal factsheet
- Meningococcal VIS
- Adult Vaccine Consent Form
- NM VFC Vaccine Administration Form
- HIPAA policy and acknowledgement form

### Norovirus

**Additional Supplies**
- Styrofoam cooler for post-collection
- Frozen ice packs (3-4) inside cooler
- Norovirus Module
- Enteric Module (if testing to rule out enteric pathogens)

**Forms**
- Norovirus Fact Sheet
- SLD General Clinical Request Form (for norovirus testing)
- SLD General Clinical Request Form (for enteric testing, if testing to rule out enteric pathogens)
- SLD General Clinical Request Form (blank)
- Instructions for collecting stool specimen (NoV and EM & NoV if testing to rule out enteric pathogens)
o Stool Specimen and Enteric Organism Transport (from CD Manual)

o CD Manual Norovirus Control Measures and Recommendations

o GI Illness Line List

o Educational materials (can also grab a pre-assembled “Noro Education, Control, and Prevention” folder)
  o Sample GI Illness Line List
  o CDC Norovirus in Healthcare Facilities Fact Sheet
  o CDC Norovirus: Facts for Food Handlers
  o CDC Norovirus Illness: Key Facts
  o CDC Clean and Disinfect Norovirus / Help Prevent the Spread of Norovirus

**Pertussis**

**Additional Supplies**

o Styrofoam cooler for post-collection

o Second cooler for vaccine

o Frozen ice packs (3-4) inside cooler

o Rubber bands (if doing cultures)

o Medication

o Pertussis PCR Kit

o Pertussis Culture Kit (optional)

o Vaccine

o Vaccine Module

**Forms**

o Pertussis Line List

o Pertussis Fact Sheet

o CD Manual Treatment, Surveillance, and Control of Pertussis

o Tdap VIS

o HIPAA policy and acknowledgement form

o Azithromycin education sheets

o SMX-TMP education sheets

o SLD General Clinical Request Form (for pertussis testing)

o Instructions for collecting pertussis PCR and culture

o Adult Vaccine Consent Form
o NM VFC Vaccine Administration Form
o Treatment of Epidemiology Cases or Contacts form

Phlebotomy
- Plastic sleeves for blood draw/tube holder
- Tourniquets
- Tubes/ tube labels
- 22 gauge butterfly needles
- 21 gauge butterfly needles
- 20 gauge butterfly needles
- Syringes of different gauges
- Alcohol pads
- Cotton balls
- Band-aids

Rash Illness

Additional Supplies
- Styrofoam cooler for post-collection
- Frozen ice packs (3-4) inside cooler
- Second cooler for vaccine
- Vaccine
- Vaccine Module
- Viral Rash Kit
- Phlebotomy Module

Forms
- Disease fact sheets: measles, varicella, hand/foot/mouth
- MMR VIS
- Chickenpox VIS
- Adult Vaccine Consent Form
- NM VFC Vaccine Administration Form
- Instructions for viral collection
- SLD General Clinical Request form (blank)
- Treatment of Epidemiology Cases or Contacts form
- HIPAA policy and acknowledgement form
Attachment D: Important Numbers

Central Epi/On-Call Epidemiologist
   Telephone: 505-827-0006
   Fax: 505-827-0013

State Laboratory Division
   Telephone: 505-383-9000
   Fax: 505-383-9011
   Kit Prep T: (505)383-9073 F: (505)383-9062

Children, Youth, and Families Department

City of Albuquerque Urban Biology Division Melise Taylor 505-250-2567 or Nick Pederson 505-452-5303

Environment Department
   http://www.nmenv.state.nm.us/NMED/field_op.html for a listing of field offices
   City of Albuquerque Environment Department Francelli Lugo 505-768-2632

DOH Public Information Officer
   Telephone: 505-827-2619

Division of Health Improvement
   Telephone: 505-476-9093
   Incident Reporting line: 1-800-752-8649

NE region call-down list
   Epidemiology Nurse, Kevin Aicher 505-946-8837
   Director of Nursing, Patrice Crass 505-476-2671

NW region call-down list
   San Juan County Nurse Manager, Kendra Matthews 505-327-4461 x 155
Cibola County Disease Intervention Specialist, Jamie Martinez 505-285-4601

Metro region call-down list
Epidemiology Nurse Francelia Jojola 505-841-4145
Nurse Epidemiologist 1 505-841-4118
Nurse Epidemiologist 2 505-841-4116
Director of Nursing 1 505-841-4675
Director of Nursing 2 505-841-4677

SE region Call-down list
Nancy Giannini 575-355-2362
Lisa McDonald 575-624-6050 ext.: 6184
Carri Redden 575-347-2409 ext.: 6224

SW region call-down list
Nurse Epidemiologist, Bernadette Gutierrez 575-528-6017
Regional Program Manager, Travis Leyva 575-528-5031 cell: 575-640-8664
Regional Health Officer, Eugene Marciniak 575-528-5137 cell: 575-649-5984
## Attachment E: Sample Day Care Inspection Form

Day Care Center: _________________________________ Director: _________________________________

Telephone: _______________ Contact Person: _________________________________

Address: __________________________________________________________ Zip: _______________

Reason for investigation:
________________________________________________________________

Facility Currently Licensed:
______________________________________________________________

Demographic Information:
_____________________________________________________________

Total Population: _______ Students: _______ Staff: _______ Kitchen Staff: _______

Classroom Population: ___Infants (0-12Mo) ___Toddler (12Mo-2Yr) ___3 Years ___4 Years ___5 Years ___Kindergarten ___School Age ___Drop ins ___Part-time

Number Bathrooms: _____ Number Diaper Changing Areas: _____

<table>
<thead>
<tr>
<th>General Inspection</th>
<th>Yes</th>
<th>No</th>
<th>Kitchen Inspection</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing notified</td>
<td>___</td>
<td>___</td>
<td>Separate kitchen staff</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Licensing/regulation/not dis.avail.</td>
<td>___</td>
<td>___</td>
<td>Clean clothes/hair restrained</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>All children/part of day</td>
<td>___</td>
<td>___</td>
<td>Clothes chd/kth &amp; Chd</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Environmental health notified</td>
<td>___</td>
<td>___</td>
<td>Food prepared at DCC</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Common airflow/rooms</td>
<td>___</td>
<td>___</td>
<td>Recent AEHD inspection</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Permanent or float teachers</td>
<td>___</td>
<td>___</td>
<td>Dry foods off floor</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Communicable disease lecture offered</td>
<td>___</td>
<td>___</td>
<td>Dishwasher/bleach rinse</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td>Information/health education offered</td>
<td>All foods covered</td>
<td>CD letter/parents &amp; staff</td>
<td>Fly &amp; rodent control</td>
<td>Separate cots/mats for naps</td>
<td>Screen door</td>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
</tr>
</tbody>
</table>

Diaper Change Areas Inspection

<table>
<thead>
<tr>
<th>Impermeable ¾”/washable</th>
<th>Tab. Tissue/every diaper change</th>
<th>10% bleach opaque bottle</th>
<th>Cross contamination prevention</th>
<th>All hands washed after change</th>
<th>Mats/cribs 30” apart when used</th>
<th>Separate cribs labeled w/names</th>
<th>Impermeable mattress covers</th>
<th>Closed container for soiled diapers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Investigator: _______________________________ Date: ____________________
Attachment F: Sample Line List

GI Illness Line List

*Confirmed Case Definition:*

<table>
<thead>
<tr>
<th>Name</th>
<th>DOB</th>
<th>age</th>
<th>gender</th>
<th>Onset date</th>
<th>Cx date</th>
<th>Meets case definition?</th>
<th>Vomiting</th>
<th>Diarrhea</th>
<th>Max stools in 24 hrs</th>
<th>Blood in stool</th>
<th>Duration</th>
<th>Phone #</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
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Attachment H

PUBLIC HEALTH DIVISION
CLINICAL PROTOCOL/MANUAL APPROVAL SHEET

PROGRAM: ERD/PHD

CLINICAL PROTOCOL/MANUAL TITLE: Public Health Nurse Investigation Guidelines

Reviewed by:

Name: ___________________________ Date: ___________________

Name: ___________________________ Date: ___________________

Name: ___________________________ Date: ___________________

Name: ___________________________ Date: ___________________

Name: ___________________________ Date: ___________________

Name: ___________________________ Date: ___________________

Program Manager: ___________________ Date: _________________

Bureau Chief: ___________________ Date: _________________

Bureau Medical Director: _________________ Date: _________________
APPENDIX 6: NMDOH ERD Case Investigation Forms

If you are an NM-EDSS user you can access the NMDOH ERD Case Investigation Forms by clicking on the Forms paddle after logging in to NM-EDSS.
Sample bacterial enteric illness notification letter to parents/guardians of child care attendees
(English)

Date:

Dear Parent or Guardian:

Someone in (Insert name of childcare center) has (Insert name of disease), an illness caused by a type of bacteria. Often people with this infection have [Select from the following major symptoms: diarrhea (diarrhea), bloody diarrhea (bloody diarrhea), fever (fever), nausea (nausea), abdominal pain (abdominal pain) after consulting the pathogen’s Clinical Disease section of this manual], sometimes for up to [Select length of illness from the Clinical Disease section of this manual: xx days (days) or weeks (weeks)]. This infection may be spread in various ways, including:

- contact with the stool (bowel movement) of an infected person,
- contact with objects (e.g., toys) that are contaminated (dirtied) with the stool of an infected person,
- contact with animals, especially dogs, cats, and poultry, which may have the bacteria in their stool, and
- eating food that is contaminated or contains the bacteria.

The most important way to prevent the spread of this infection is by careful hand washing before eating or preparing food, after changing diapers or using the bathroom, and after handling pets or other animals. Food preparation surfaces (e.g., cutting boards) and utensils should be thoroughly washed after preparing uncooked meat.

If your child experiences the above symptoms, please keep your child home and consult your healthcare provider. Show your health care provider this letter. You will probably be advised to provide a stool sample from your child that will be sent to a laboratory and tested. If the laboratory test is positive, your health care provider will determine the appropriate treatment for your child.

Please call the public health nurse (insert contact name & number) if you have questions or to let us know if your child becomes ill with any of these symptoms or has a positive stool test. It is important that your ill child should remain home until approved to return,

Sincerely,
Sample bacterial enteric illness notification letter to parents/guardians of childcare attendees (Spanish)

Date:

Estimado padre de familia o guardián:

Alguna persona en (Insert name of childcare center) ha tenido (Insert name of disease), la cual es una enfermedad causada por un tipo de bacteria. La mayoría de la gente con esta infección tiene: [Select from the following major symptoms: diarrhea (diarrea), bloody diarrhea (diarrea con sangre), fever (fiebre), nausea (náusea), abdominal pain (dolor abdominal) after consulting the pathogen’s Clinical Disease section of this manual], algunas veces hasta por [Select length of illness from the Clinical Disease section of this manual: xx days (días) or weeks (semanas)]. Esta infección puede propagarse de varias maneras, incluyendo:

- Contacto con las heces (movimiento de los intestinos) de una persona infectada.
- Contacto con objetos (p.ej., juguetes) que están contaminados (sucios) con las heces de una persona infectada.
- Contacto con animales, especialmente perros, gatos y aves que pueden tener la bacteria en sus heces, y
- por comer alimentos que están contaminados o que tienen la bacteria.

La manera más importante de prevenir que se propague esta infección es lavándose las manos cuidadosamente antes de comer o de preparar los alimentos, después de cambiar pañales o de usar el baño, y después de haber acariciado a las mascotas o a otros animales. Las superficies donde se prepara la comida (p. ej. Las tablas para picar), y los utensilios que se usan deben de ser lavados a fondo después de preparar carne cruda. El centro de cuidados para niños vigila cuidadosamente estas prácticas higiénicas y continuará haciéndolo.

Si nota que su niño muestra los síntomas que se mencionan arriba, por favor déjelo en la casa y consulte a su médico. Muéstrele esta carta. Probablemente se le aconsejará que entregue una muestra de las heces de su niño para que la puedan estudiar. Si el resultado es positivo, su médico determinará el tratamiento apropiado para su niño.

Por favor llame a su enfermera de salud pública (insert contact name & number) si usted tiene preguntas o para que nos informe si su niño se enferma con cualquiera de estos síntomas, o si el resultado de la prueba de sus heces es positivo. Es muy importante que su niño permanezca en la casa hasta que ella o él ya no tengan fiebre ni diarrea.

Atentamente,
Sample parasitic enteric illness notification letter to parents/guardians of childcare attendees (English)

Date:

Dear Parent or Guardian:

Someone in *(Insert name of childcare center)* has *(Insert name of disease)*, an illness caused by a type of parasite. Most people with this infection have * [Select from the following major symptoms: diarrhea (diarrhea), bloody diarrhea (bloody diarrhea), fever (fever), nausea (nausea), abdominal pain (abdominal pain) after consulting the pathogen’s Clinical Disease section of this manual], sometimes for up to [Select length of illness from the Clinical Disease section of this manual: xx days (days) or weeks (weeks)]. This infection may be spread in various ways, including:

- contact with the stool (bowel movement) of an infected person,
- contact with objects (e.g., toys) that are contaminated (dirtied) with the stool of an infected person,
- contact with animals which may have the parasite in their stool,
- eating food that is contaminated or contains the parasite, and
- water, especially in recreational settings (e.g., play tables or pools), that contains the parasite

The most important way to prevent the spread of this infection is by careful hand washing before eating or preparing food, after changing diapers or using the bathroom, and after handling pets or other animals. Food preparation surfaces (e.g., cutting boards) and utensils should be thoroughly washed after preparing uncooked meat. The childcare center carefully monitors these practices and will continue to do so.

If your child experiences the above symptoms, please keep her/him home and consult your healthcare provider. Show your health care provider this letter. You will probably be advised to provide a stool sample from your child so that it can be tested. If the test is positive, your health care provider will determine the appropriate treatment for your child.

Please call the public health nurse *(insert contact name & number)* if you have questions or to let us know if your child becomes ill with any of these symptoms or has a positive stool test. It is important that your child remain home until she or he no longer has fever or diarrhea.

Sincerely,
Sample parasitic enteric illness notification letter to parents/guardians of childcare attendees (Spanish)

Date:

Estimado padre de familia o guardián:

Alguna persona en (Insert name of childcare center) tiene (Insert name of disease), la cual es una enfermedad causada por un tipo de parásito. La mayoría de la gente con esta infección tiene: [Select from the following major symptoms: diarrhea (diarrea), bloody diarrhea (diarrea con sangre), fever (fiebre), nausea (náusea), abdominal pain (dolor abdominal) after consulting the pathogen’s Clinical Disease section of this manual], algunas veces hasta por [Select length of illness from the Clinical Disease section of this manual: xx days (días) or weeks (semanas)]. Esta infección puede propagarse de varias maneras, incluyendo:

- Contacto con las heces (movimiento de los intestinos) de una persona infectada.
- Contacto con objetos (p.ej., juguetes) que están contaminados (sucios) con las heces de una persona infectada.
- Contacto con animales que pueden tener el parásito en sus heces,
- Por comer alimentos que están contaminados o que tienen el parásito, y
- por haber tragado agua, especialmente en los lugares de recreo acuático, (p. ej. Las mesas para jugar o las piscinas), que contienen el parásito.

La manera más importante de prevenir que se propague esta infección es lavándose las manos cuidadosamente antes de comer o de preparar los alimentos, después de cambiar pañales o de usar el baño, y después de haber acariciado a las mascotas o a otros animales. Las superficies donde se prepara la comida (p.ej. Las tablas para picar), y los utensilios que se usan deben de ser lavados a fondo después de preparar carne cruda. El centro de cuidados para niños vigila cuidadosamente estas prácticas higiénicas y continuará haciéndolo.

Si nota que su niño muestra los síntomas que se mencionan arriba, por favor déjelo en la casa y consulte a su médico. Muéstrele esta carta. Probablemente se le aconsejará que entregue una muestra de las heces de su niño para que la puedan estudiar. Si el resultado es positivo, su médico determinará el tratamiento apropiado para su niño.

Por favor llame a su enfermera de salud pública (insert contact name & number) si usted tiene preguntas o para que nos informe si su niño se enferma con cualquiera de estos síntomas, o si el resultado de la prueba de sus heces es positivo. Es muy importante que su niño permanezca en la casa hasta que ella o él ya no tengan fiebre ni diarrea.

Atentamente,
## APPENDIX 8: Food Handler and Daycare Worker Exclusion Criteria

<table>
<thead>
<tr>
<th>Condition</th>
<th>Food Handler</th>
<th>Healthcare Worker</th>
<th>Daycare Worker</th>
<th>Daycare Attendee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active diarrhea, including with positive laboratory result for Campylobacteriosis, Cryptosporidiosis and Giardiasis</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND proper hygiene measures can be maintained</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND proper hygiene measures can be maintained</td>
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</tr>
<tr>
<td>Salmonellosis</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND there are <strong>TWO</strong> consecutive negative stool cultures taken at least 24 hours apart, at least 48 hours after last dose of antimicrobials, if given*</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND there are <strong>TWO</strong> consecutive negative stool cultures taken at least 24 hours apart, at least 48 hours after last dose of antimicrobials, if given*</td>
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<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved.</td>
</tr>
<tr>
<td>Shigellosis and STEC</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND there are <strong>TWO</strong> consecutive negative stool cultures taken at least 24 hours apart, at least 48 hours after last dose of antimicrobials, if given*</td>
<td>Exclude <strong>symptomatic</strong> persons until diarrhea has resolved, AND there are <strong>TWO</strong> consecutive negative stool cultures taken at least 24 hours apart, at least 48 hours after last dose of antimicrobials, if given*</td>
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</tr>
</tbody>
</table>

*If a stool culture is positive, then it should be repeated until negative.