Salmonellosis (nontyphoid)

Summary

Salmonella infection most commonly causes acute gastroenteritis. 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 handwashing 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 2007, the five most common serotypes of *Salmonella* reported in New Mexico were *Salmonella* Newport, *Salmonella* Typhimurium, *Salmonella* Javiana, *Salmonella* Enteritidis, and *Salmonella* Muenchen.

Transmission

- Reservoir: *Salmonella* have been found in symptomatic and asymptomatic domestic and wild animals, including poultry, swine, cattle, rodents, and pets such as 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 age 5 years may excrete the organism for more than one year. Antimicrobial therapy can prolong excretion.

Clinical Disease

- Incubation period: Usually 12 to 36 hours, with a range of 6 to 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. 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.

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

- Reporting: **Report all suspected 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 your investigation. Investigation information should also be entered into NM-EDSS per established procedures.

Control Measures

For a summary of work and daycare exclusion criteria for all enteric pathogens see Appendix 1.

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:
         - 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 2 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.

      1.1.b 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 control practitioner) 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 for handling feces and contaminated clothing and bed linen.

   1.2. Prophylaxis: Not applicable.
2. Contact management
   2.1. Isolation:
      2.1.a Stool cultures should be obtained on household contacts that 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 handwashing after using the toilet, changing diapers, and before and after handling food).
   3.2. 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.
   3.3. Immunization: Not applicable.

Managing *Salmonella* in Child Care Centers

1. Outbreaks of *Salmonella* infection in child care centers are uncommon.
2. Management of sporadic cases
   2.1. 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 extremely rare, it is reasonable to allow asymptomatic children to return to the child care center 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 *Salmonella* in the facility (Subsection D of 8.16.2.20 NMAC). See Appendix 8 for a template of a notification letter.
   2.3. 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.
   2.4. 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.
   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.
   - 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 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.

3. Outbreak
   3.1. If an outbreak of salmonellosis (i.e., 2 or more cases) is suspected in a child care facility, the Epidemiology and Response Division should be notified immediately. Outbreaks of *Salmonella* in this situation would ordinarily be controlled by exclusion of symptomatic children and staff.

References:

American Academy of Pediatrics. Pickering LK, ed. 2006 Red Book: Report of the Committee on Infectious Diseases. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006.

Heymann, DL, ed. Control of Communicable Diseases Manual. 18th edition. Washington, DC: American Public Health Association; 2004.

For a summary of the clinical characteristics of common enteric pathogens, see Appendix 1.

SALMONELLOSIS

What is salmonellosis?
Salmonellosis is a disease caused by Salmonella bacteria. It usually affects the 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 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?
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 and food handlers may return to daycare/work after two negative stool culture results.

How can I protect myself and my family from getting salmonellosis?
You can decrease your chance of coming in contact with *Salmonella* 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.)
- 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.

Epidemiology and Response Division
505-827-0006

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SALMONELOSIS

¿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, y los manipuladores de alimentos pueden regresar a la guardería o 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.