



SALMONELLOSIS (Non-Typhoid or Paratyphoid)

(See also TYPHOID FEVER, TYPHOID CARRIER, and PARATYPHOID FEVER)

1. **Agent:** Salmonella, a gram-negative bacillus with more than 2,500 serotypes, including S. Paratyphi B tartrate positive.
2. **Identification:**
 - a. **Symptoms:** Acute gastroenteritis with sudden onset of fever, headache, abdominal pain, diarrhea, nausea, and sometimes vomiting. Dehydration is very common in children and the elderly. Occasionally, symptoms may begin with acute gastroenteritis and develop into septicemia or focal infection, where the organism may localize in any tissue of the body, which may cause abscesses, arthritis, cholecystitis meningitis, endocarditis, pericarditis, pneumonia, or pyelonephritis. Asymptomatic infections may occur.
 - b. **Differential Diagnosis:** Other enteric pathogens or toxins or typhoid. Recurrent salmonellosis is an AIDS-defining condition.
 - c. **Diagnosis:** Persons with isolation of Salmonella from stool, blood, urine or any other body fluids or tissues are “culture confirmed” cases. Identification of the organism through polymerase chain reaction (PCR) testing is also an acceptable form of diagnosis.
3. **Incubation:** 6-72 hours, usually about 12-36 hours for gastroenteritis. Longer and variable for other manifestations of salmonellosis.
4. **Reservoir:** Humans and animals, both domestic and wild.
5. **Source:** Feces of infected persons and animals; raw or undercooked eggs and unpasteurized egg products; undercooked meat and poultry; unpasteurized milk or milk products; pet reptiles and chickens; unsterilized folk remedies/supplements of animal or herbal origin; water or food contaminated with fecal matter, including fresh produce.
6. **Transmission:** Most cases of salmonellosis occur from contaminated foods of animal origin or contaminated produce. Fecal-oral transmission, from animal or human, also occurs.
7. **Communicability:** Variable. As long as organisms are excreted. Usually ranges from 2-5 weeks but can last for several months to years.
8. **Specific Treatment:** Acute cases of gastroenteritis should not routinely be treated with antimicrobials, as certain antibiotics may prolong shedding of the organism. Ampicillin, ciprofloxacin, chloramphenicol, trimethoprim-sulfamethoxazole or third generation cephalosporins may be prescribed for treatment of bacteremia, enteric fever, or disseminated infections. Consult with ACDC for current regimens for treating carriers.
9. **Immunity:** None. Carrier state occasionally continues for months, especially in infants or cancer patients. Chronic carrier state (>6 months) is rare. Patients with HIV infection are at risk of recurrent septicemia.

REPORTING PROCEDURES

1. **Reportable.** California Code of Regulations, Section 2500.
2. **Report Form:**

SALMONELLOSIS CASE REPORT AND CONTACT ROSTER¹

All pages, including the contact roster, **MUST** be submitted. Forms that are pending SOS clearance **SHOULD NOT** be held in the district. For reporting purposes, the form

¹

<http://publichealth.lacounty.gov/acd/Diseases/EpiFor>

ms/SalmonellosisRep.pdf



should be submitted for closure as soon as possible, after completion of interview. If necessary, follow-up of SOS should be continued in the district, after submission of forms.

If a food item that was commercially prepared is the LIKELY source of this infection, **FOODBORNE INCIDENT REPORT**²(FBIR) should be filed. For likelihood determination and filing procedures, see Part 1, Section 7 – Reporting of a Case or Cluster of Cases Associated with a Commercial Food: Filing of Foodborne Incident Reports.

3. Epidemiologic Data:

- a. Exposure to others with diarrhea in or outside of household.
- b. Attendance at gatherings where food was served; consumption of food from restaurants or other commercial establishments within the incubation period. Obtain detailed information on date, time, types of foods or beverages ingested; ascertain whether dining companions had similar symptoms.
- c. Specific food history for at-risk products (e.g., unpasteurized milk or cheese, raw or poorly cooked fish, beef, eggs or poultry products) and place of purchase. Handling of raw meats or eggs while cooking should also be assessed.
- d. If associated with childcare center, institution, or babysitting group, obtain detailed information on clientele, caretakers, and sources of food served at the facility or residence, ascertain if others are ill.
- e. Contact with pets, reptiles, or farm animals before onset.
- f. History of medication, medical-surgical, dental, or gastrointestinal procedures. Should include all over the counter, "organic", or and "holistic", folk/herbal medicines or herbs.

- g. Travel, hiking, camping, or hunting prior to onset.
- h. Visitors during incubation.
- i. Type of water supply used and possible exposure to sewage.
- j. For infants 3 months of age and under at obtain detailed epidemiologic data and cultures on caretaker(s) including babysitter (even if asymptomatic). Carefully review food handling practices of caretaker(s) to determine whether cross-contamination of infant formula or food was involved.
- k. If an outbreak of salmonellosis is identified while investigating an individual case, discuss with supervisor and notify ACDC immediately by telephone.

CONTROL OF CASE, CONTACTS & CARRIERS

Home visit as necessary—a face interview is conducted as necessary. Refer to “Public Health Nursing Home Visit **AS NECESSARY** (HVAN) Algorithm (B-73 Part IV Public Health Nursing Home Visit Protocol³)

Contact within 24 hours to determine if SOS involved; otherwise, investigate within 3 days. For definition of SOS, see B-73, Part I, Section 13.

Protection of the public health is a priority in the management of SOS. Reasonable efforts to contact the case must be made by the PHN. If unable to locate or the case is uncooperative, refer to PHI in a timely manner to assist in locating case and determining SOS.

A notice from the PHN is required upon admission to a skilled nursing or intermediate care facility (B-73, Part II) describing needed infection control measures.

²

https://www.visualcmr.net/webvcmr/pages/public/pub_FBI_Report.aspx

³

<http://publichealth.lacounty.gov/acd/procs/b73/HomeVisitProtocol.pdf>



CASE:

1. **Precautions:** Enteric precautions until bacteriologically cleared as described below.

Sensitive Occupation or Situation: This includes, but not limited to, food handlers specifically those who prepare or distribute food, healthcare workers and child or adult caregivers. Consult with the AMD or ACDC as indicated to help determine if they should be managed as an SOS and if stool clearance is required.

Remove from sensitive work, regardless of symptom status, until 2 consecutive negative stool specimens are obtained at least 24 hours apart. If antibiotics were taken (generally not recommended) stool sample should be taken at least 48 hours after the completion of antimicrobial treatment.

In select circumstances, workers who are asymptomatic AND have formed stools may be cleared to return to work without stool clearance at the discretion of the AMD and/or ACDC. Case-by-case decisions should be informed by their core occupational duties, their access to and ability to use personal protective equipment and exercise infection prevention measures.

Children less than 5 years of age

Children attending a daycare or school and are symptomatic are to be removed. They may return to daycare or school when asymptomatic and have had formed stools for at least 48 hours. Stool clearance is not required unless ordered by AMD.

The daycare or school must be contacted to assess for the possibility of an outbreak and provide control measures to prevent the spread of infection. The facility should be monitored for two weeks after return of the child to ensure that no other children develop similar illness.

2. **Non-sensitive Occupation or Situation:** No restrictions unless a household contact(s) is in a SOS. If household contact is symptomatic and an SOS, case will need to submit weekly specimens until household contact and case has been cleared or contact with case is broken.

3. **Suspected Outbreaks or Clusters:** Suspected outbreaks include situations when there are two or more cases in a daycare or assisted living facility, or when there are two or more cases without any obvious outside contacts (i.e., the two cases are not members of the same family or grouping). For these situations, an outbreak investigation should be opened and consult with the AMD or a DPH physician.

CONTACTS:

Household members or persons who share a common source.

1. **Sensitive Occupation or Situation:**
 - a. **Symptomatic:** Remove from sensitive work or situation until 2 consecutive negative stool specimens are obtained at least 24 hours apart, taken at least 48 hours after the completion of antimicrobial treatment, if antimicrobial treatments were taken. ***Collection also on case until both are cleared***
 - b. **Asymptomatic:** Do not remove from sensitive work or situation. No further action needed. Inform these individuals to seek medical care and request testing if they develop salmonellosis symptoms.
2. **Non-sensitive Occupation or Situation:**
 - a. **Symptomatic:** Can return to work or situation 48 hours after developing formed stools.
 - b. **Asymptomatic:** No further action needed. Inform these individuals to seek medical care and request testing if they develop compatible symptoms.
3. **Chronic carriers:**
 - a. **Definition:** A case who continue to harbor a pathogen such as salmonella for months or years. ***Consult with AMD if case has remained positive for 2 months or more. Clearance, including indications for antimicrobial therapy, is at the discretion of AMD in consultation with ACDC.**



4. Presumptive Cases:

- a. **Definition:** Includes any person who is epidemiologically linked to a confirmed case, who has diarrhea (more than 2 loose stools in 24 hours) and fever, or diarrhea and at least 2 other symptoms.
- b. **Follow up:** Actions are the same as for a confirmed case—if SOS, exclusion and clearance with 2 negative stools; if not SOS, no restrictions unless household contact is in an SOS. Submit a [SALMONELLA CASE REPORT](#)⁴.

PREVENTION AND EDUCATION

1. Thoroughly cook all food derived from animal sources.
2. Properly refrigerate perishable food.
3. Avoid the use of unpasteurized milk or cheese or the ingestion of raw or undercooked eggs or meat.
4. Avoid cross-contamination of other foods. All utensils, including chopping boards that have been in contact with raw meat or poultry products, should be washed before using for preparation of other food. After working with raw meat or poultry products, hands should be washed before preparing other foods.
5. Wash fresh produce before cutting or consuming.
6. Recommend removal of known or suspected animal sources (e.g., pet turtles, lizards, snakes, iguanas, and chicks).
7. Emphasize hand washing, cleaning fingernails and personal hygiene.
8. Dispose of feces, urine, and fomites properly.

DIAGNOSTIC PROCEDURES

1. **Culture:**

Container: Enteric.

Laboratory Form: [Test Requisition Form H-3021](#)⁵

Examination Requested: Salmonella.

Material: Feces. Urine only if original positive culture was the urine. Follow instructions provided with container.

Storage: Protect from overheating. Maintain at room temperature. Specimen should be delivered to the Public Health Laboratory no later than 4 days after collection.

Remarks: Mark "SOS" (sensitive occupation or situation) in red on specimen, if appropriate.

2. **Culture for Identification (CI):**

Container: Enteric

Laboratory Form:

Test Requisition Form H-3021

Material: Pure culture on appropriate medium.

Storage: Same as above.

3. PHN may investigate and test suspected animal sources; please consult with AMD or ACDC.

PROCEDURE FOR COLLECTING SPECIMENS FOR CULTURE FROM REPTILES IN SALMONELLOSIS CASES

If the reptiles are still in the home, specimen collection is required on each animal. If not, specimens may be collected from the empty aquarium or cage. The PHN may instruct the owner to collect the specimens. *If specimens are not collected, documentation is required in the case report form or event notes as to why the specimens were not collected.

Note: In instances with severe disease (e.g., meningitis or other invasive infection) or if there are many reptiles, call ACDC for help with

⁴ <http://publichealth.lacounty.gov/acd/Diseases/EpiForms/SalmonellosisRep.pdf>

⁵ <http://www.publichealth.lacounty.gov/lab/docs/H-3021%20Test%20Request%20Form.pdf>



specimen collection.

1. Collect solid stool specimens from each reptile. As most reptiles are small, several stools from one reptile may be placed in one enteric container. The owner may collect stools over two or three days.
2. If no stools are available, a swab of the animal may be taken. This is best performed with another person holding the reptile. Using a moistened swab, wipe the underside of the animal near the cloaca.
3. Swabs of the reptile environment should be taken. Wet surfaces are best to culture. Thoroughly wet the swab by rolling it along the surface you are culturing. Use two or three sterile swabs and break them off into an enteric container; or use a culturette kit (normally used for throat swabs). If the surface is dry, first wet the swab with the transport media or sterile water. Swab areas with stool or residue on them, the bottom and sides of the container, and any objects that the animals use, such as a log, rocks used for sunning, food or water dishes.
4. Water may be collected from tanks or water dishes with a syringe. Scoop up water and bottom residue. Place 5 ml (one teaspoon) of liquid in a routine enteric container; fill to the line.
5. Carefully label all specimens with the last name of the human case and the type of animal or specimen taken (e.g., last name, iguana log; last name, turtle terrarium wall; last name, snake stool, etc.). The Public Health Laboratory should receive specimens no later than 4 days after collection.
6. Notify the Public Health Laboratory, General Bacteriology, if you are sending in animal specimens, especially if there will be more than five.