



SALMONELLOSIS

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

1. **Agent:** *Salmonella*, a Gram-negative bacillus with more than 2,000 serotypes.
2. **Identification:**
 - a. **Symptoms:** Acute gastroenteritis with sudden onset of fever, headache, abdominal pain, diarrhea, nausea, and sometimes vomiting. Occasionally the clinical course is that of enteric fever or septicemia. The organism may localize anywhere in the body, causing abscesses, arthritis, meningitis, endocarditis, pericarditis, pneumonia, or pyelonephritis. Asymptomatic infections occur.
 - b. **Differential Diagnosis:** Other enteric pathogens or toxins, typhoid. Recurrent salmonellosis is an AIDS-defining condition.
 - c. **Diagnosis:** Isolation of organism from stool, blood, urine or other body fluids or tissues.
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; meat products; unpasteurized milk or milk products; pet reptiles and chicks; unsterilized pharmaceuticals of animal origin; water or food contaminated with fecal matter, including fresh produce.
6. **Transmission:** Fecal-oral route, from animal or human, with or without intermediary contamination of foodstuffs.
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 indicated for treatment of bacteremia, enteric fever, or disseminated infections. Treatment of chronic carriers or of cases in a sensitive occupation or situation (SOS) who remain positive for more than 2 months may be considered. 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:**

LAC DHS SALMONELLOSIS AND CONTACT ROSTER (acd-salm)

All pages including the contact roster MUST be submitted. The original form should not be held in the district pending SOS clearance; for reporting purposes, the form should be submitted as soon as possible after completion of interview. Follow-up of SOS can be continued in the district without the original form.

If a prepared commercial food item is the LIKELY source of this infection, a **FOODBORNE INCIDENT REPORT (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, raw or poorly cooked beef, liver, eggs or poultry products) and place of purchase. Handling of raw meats or eggs while cooking should also be assessed.
- d. If associated with child care center, institution, or babysitting group, obtain detailed information on clientele, caretakers, and sources of food served at the facility or residence.
- e. Contact with pets, reptiles, or farm animals before onset.
- f. History of medication, medical-surgical or gastrointestinal procedures. Should include all over-the-counter, "organic" or "holistic" 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 time of onset, if source is not identified, 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 advise ACDC by telephone.

CONTROL OF CASE, CONTACTS & CARRIERS

Public Health Nursing Home Visit Protocol:
Home visit as necessary – a face to 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 Protocol).

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. Individuals living in a group setting, including a skilled nursing or intermediate care facility, are considered to be in a sensitive situation.

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.

Prior written approval from the Area Medical Director, after consultation with ACDC, is required before admission to a skilled nursing or intermediate care facility (B-73, **Part II**, Section 2A) is permitted.

For paratyphoid fever, clearance of cases and contacts is the same as for typhoid fever cases (see PARATYPHOID FEVER).

CASE:

1. **Precautions:** Enteric precautions until bacteriologically cleared as described below.
2. **Sensitive Occupation or Situation:** Remove from sensitive work until 2 successive negative feces specimens are obtained at least 24 hours apart, taken at least 48 hours after the completion of antibiotic treatment, if antibiotics were taken. If specimens remain positive at the end of 2 months, confer with Area Medical Director, or if necessary with ACDC.
3. **Non-sensitive Occupation or Situation:** No restrictions unless household contact is in a SOS. If household contact is in a SOS, then



release after obtaining 2 negative feces specimens as above.

CONTACTS:

Household members or persons who share a common source.

1. Sensitive Occupation or Situation:

- a. **Symptomatic:** Remove from work until 2 negative specimens as for case. Then, weekly specimens until case released or contact with case is broken.
- b. **Asymptomatic:** Do not remove from work unless hand-washing practices are questionable. May be assigned to non-sensitive work duties, if available. Collect weekly specimens until case released or contact with case broken. If positive, remove from work until cleared as for case.

2. Non-sensitive occupation or situation:

Obtain a specimen if symptomatic.

3. Presumptive Cases:

- a. Definition: 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 is the same as for a confirmed case (i.e., - clearance as needed and submission of a case history form for reporting).

PREVENTION-EDUCATION

1. Thoroughly cook all food derived from animal sources.
2. Properly refrigerate perishable food.
3. Avoid the use of unpasteurized milk 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, the 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 and iguanas).
7. Emphasize hand washing, cleaning fingernails and personal hygiene.
8. Dispose of feces, urine, and fomites properly.

DIAGNOSTIC PROCEDURES

1. Culture:

Container: Enterics.

Laboratory Form: Test Requisition Form H-3021

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. Comparative Medical and Veterinary Services may investigate and test suspected animal sources at the request of ACDC.

PROCEDURE FOR COLLECTING SPECIMENS FOR CULTURE FROM REPTILES IN SALMONELLOSIS CASES

If the reptiles are still in the home, specimens may be collected 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.

Note: In instances with severe disease (e.g., meningitis or other invasive infection) or if there are many reptiles, call ACDC for help with 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 a log, rocks used for sunning, or 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 name of the human case and the name and type of animal or specimen taken (e.g., iguana log, turtle terrarium wall, snake stool, etc.). Specimens should be received in the Public Health Laboratory by the fourth day after collection.
6. Notify the Public Health Laboratory, General Bacteriology, that you are sending in animal specimens, especially if there will be more than five.