

Shigellosis

Investigative Guidelines

April 2018

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To determine whether there is a source of infection of public health concern (e.g., a food handler or day-care facility) and to stop transmission from such a source
2. To assess the risk of transmission to others, and to prevent such transmission
3. To identify other cases.

1.2 Laboratory and Physician Reporting Requirements

Laboratories and physicians are required to report infections to the local health department within one working day of identification or diagnosis. Reports should not be delayed for serotyping or final laboratory confirmation. Laboratories must submit isolates to the Oregon State Public Health Laboratory (OSPHL).

1.3 Local Health Department Reporting and Follow-Up Responsibilities

1. Report all confirmed and presumptive (but not suspect) cases to the Oregon Health Authority (OHA) Acute and Communicable Disease Prevention Section (ACDP) by the end of the calendar week of initial physician or laboratory report. Use Orpheus or the standard case-report form.
2. Begin follow-up investigation within one working day. Use Orpheus or the Shigellosis case investigation form.
Submit all case data electronically via the Orpheus application.
3. Ensure that laboratories forward the first isolate from each patient to OSPHL for speciation as required by rule.
4. For recognized outbreaks, complete the appropriate investigation summary form in consultation with the assigned ACDP epidemiologist when the investigation is complete.

2. THE DISEASE AND ITS EPIDEMIOLOGY

2.1 Etiologic Agent

Shigella spp.—Gram-negative, rod-shaped bacteria. There are four *Shigella* species: *S. sonnei* (Group D), *S. flexneri* (Group B), *S. dysenteriae* (group A), and *S. boydii* (Group C). *S. sonnei* is by far the most common species reported

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in Oregon. *S. dysenteriae* infections are rare in Oregon, but when they do occur are often serious, with a high fatality rate. *S. flexneri* is seen primarily among Hispanics or in persons who have come from, or traveled to, developing countries, or who have had contact with such individuals. *S. boydii* infections are uncommon in Oregon.

2.2 Description of Illness

Shigellosis is characterized by acute onset of diarrhea, usually accompanied by moderate to high fever and cramping abdominal pain or sometimes with nausea and vomiting. Illness is self-limited, usually lasting 3–10 days. Persistent (asymptomatic) carriage lasting weeks or months may occur, although less often than with *Salmonella* infections. Diarrhea is often marked by blood, mucus, or pus in the stools. Infections can be severe, particularly in young children and the elderly. Mild and asymptomatic infections also occur.

2.3 Reservoirs

Infected humans only.

2.4 Modes of Transmission

Fecal-oral. The infectious dose is very small; as few as 10 organisms may be sufficient. Transmission was classically attributed to the “four F’s”: food, fingers, feces, flies. Commonly recognized vehicles or mechanisms include:

1. Person-to-person transmission within households and day-care facilities or among other close contacts whenever hand washing after defecation is inadequate. Outbreaks have occurred among homeless populations. Care givers are also at risk of infection due to fecal contamination of hands.
2. Sexual contact, including oral-anal contact.
3. Fecally contaminated inanimate objects (fomites).
4. Food that is contaminated during harvest, transportation, preparation, or serving—most commonly food served without cooking (e.g., lettuce, cold sandwiches).
5. Contaminated and inadequately treated drinking water.
6. Ingestion of contaminated and untreated recreational water.
7. Although there are no natural animal reservoirs, some non-human primates can be infected and could become sources of infection for animal handlers or exotic pet owners.

2.5 Incubation Period

1–4 days; rarely, as short as 12 hours or as long as 7 days.

2.6 Period of Communicability

Patients are communicable for as long as organisms are excreted in feces, typically about 1–4 weeks after onset. Some individuals may remain carriers for

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several months. The period of excretion is usually shortened by appropriate antibiotic therapy.

2.7 Treatment

1. Fluid and electrolyte replacement, if indicated.
2. Therapy using antibiotics to which the isolated strain is susceptible will shorten the duration of illness and period of communicability.
3. High levels of resistance to ampicillin and trimethoprim/sulfamethoxazole (TMP/SMX) have been found in Oregon. Treatment should be based on susceptibilities.
4. Antimotility agents are contraindicated, as they may prolong the illness and increase the risk of invasive disease.

3. CASE DEFINITIONS, DIAGNOSIS AND LABORATORY SERVICES

Some laboratories are now using culture-independent diagnostic tests (CIDTs) such as polymerase chain reaction (PCR), which detect specific nucleic acid sequences of a bacterium. However, isolates, which can only be gotten by culture, are still needed for subtyping for public health purposes. Some private laboratories will try to isolate *Shigella* from the PCR-positive specimen (commonly known as “reflex” culturing). If recovered, the *Shigella* isolate should be submitted to the Oregon State Public Health Laboratory (OSPHL) for confirmation and subtyping. Laboratories that do not set up reflex cultures in-house should submit the PCR-positive specimen to OSPHL, which will set up the reflex culture. If the specimen is PCR-positive, but the reflex culture is negative or not done, the case will be considered “presumptive.” When a PCR-positive test is reported before the culture is finalized, please proceed to interview the case.

3.1 Confirmed Case Definition

Anyone with *Shigella* isolated in culture from any clinical specimen.

3.2 Presumptive Case Definition

Compatible illness in someone epidemiologically linked to a confirmed case

OR

Anyone with *Shigella* spp. or *Shigella* /enteroinvasive *E. coli* (EIEC) detected in a clinical specimen using culture-independent diagnostic testing (CIDT) such as PCR, and the reflex culture is negative, or not done.

3.3 Suspect Case (not reportable to PHD)

Anyone with an undiagnosed febrile diarrheal illness.

3.4 Services Available at Oregon State Public Health Laboratory (OSPHL)

The OSPHL provides stool culture and isolate identification of *Shigella* spp. Serotyping is performed for speciation. Whole genome sequencing is performed

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for *Shigella sonnei* isolates for surveillance purposes. Complete specimen acceptance criteria are available on the OSPHL Lab Test Menu at www.healthoregon.org/labtests.

For stool culture, submit stool in Enteric Pathogen Transport (EPT) media (e.g., Cary Blair). Store and transport specimens at refrigerated temperatures for receipt at the OSPHL within 24 hours of specimen collection.

If subsequent stool specimens are submitted for return to work or school, indicate this on the Test Request Form. Subsequent specimens will not be cultured without this information.

For isolate identification, submit a pure culture of the isolate in an agar slant or on non-selective plate media. Store and transport at ambient temperatures.

All specimens and isolates must be properly packaged. The test requested must be indicated on the OSPHL General Microbiology Test Request Form (Form #60; available from the OSPHL at <http://www.bitly.com/phl-forms>).

N.b. Stool specimens will not be cultured unless obtained before initiation of therapy, or after 48 hours have passed since discontinuation of antimicrobials. For follow-up (test-of-cure) cultures, refer to §5.6.

4. ROUTINE CASE INVESTIGATION

4.1 Case Interview

1. Identify possible sources of infection

For the 1 to 5 days before onset, determine:

- Name, diagnosis, telephone number and address of any acquaintances or household members with a similar illness. (Anyone meeting the presumptive case definition should be reported and investigated in the same manner as a confirmed case.)
- Attendance or employment at a day-care facility by the case or a household member of the case. (If the case or a household member attends or works at a day-care facility, see §6.1)
- Name, date, and location of meals eaten at restaurants or public gatherings.
- Source(s) of drinking water, including at home and work, as well as water from streams, lakes or fountains (either consumed purposefully or accidentally during work or sports activity) and incidental sources (for example, communities visited during a vacation). Water used only after boiling need not be included. If a public water supply is implicated, consult with ACDP.
- Travel outside the United States or contact with others known to have traveled outside the U.S.
- Sexual contact involving potential fecal exposure.
- Whether the case has been homeless.

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4.2 Identify Potentially Exposed Persons

Determine whether the case or any household members attend or work at a day-care facility, or work as food handlers, health-care workers, or residential-care providers. If so, refer to §6.

4.3 Environmental Evaluation

If the source of infection appears to be associated with a day-care facility, restaurant, dairy, homeless encampment, or public drinking water supply; or, if the case attends, or works at a day-care facility or works as a food handler, health-care provider, or residential-care provider, see §6.

5. CONTROLLING FURTHER SPREAD

5.1 Patient/Household Education

1. Basic instruction about hand washing after defecation or diaper changing and before food preparation should be provided to cases and potentially exposed contacts.
2. As indicated, provide other pointers about minimizing fecal exposure in daily life.

5.2 Isolation of Cases

Standard precautions are adequate to prevent transmission of shigellosis.

5.3 Children in Day Care

Children with confirmed or presumptive *Shigella* infections may not attend a school or day-care facility unless special exemption is granted by the local health officer. An exemption should be granted only if cohorting (separating infected children from uninfected children) and special care with hand washing after diaper changing and before food handling can be implemented. Exemption may also be considered if the affected child is of school age. Restrictions on confirmed cases shall not be lifted until results of licensed laboratory tests of two consecutive approved fecal samples collected not less than 24 hours apart identify no pathogens. (see §5.6).

5.4 Occupational Restrictions

Persons with confirmed or presumptive *Shigella* infections may not work as food handlers, or in a school, day-care, health-care, or residential facility unless special exemption is made by the local health officer. Exemptions can be considered for asymptomatic food handlers if they are being treated with an antibiotic to which the isolate is susceptible, and they have excellent personal hygiene. The food-service facility should have a system in place of monitored hand washing. In general, restrictions on confirmed cases shall not be lifted until results of licensed laboratory tests of two consecutive approved fecal samples collected not less than 24 hours apart identify no pathogens. Individuals may return to work without restrictions after two consecutive negative stool cultures (see §5.6).

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5.5 Restrictions on Household Contacts

None.

5.6 Follow up Stool Cultures

Routine follow-up cultures are not indicated unless the case or a household contact is a day-care attendee or food handler, or works in a day-care, health-care, or residential facility (“high-risk individuals”). Other symptomatic household members should be encouraged to seek medical attention from their regular providers.

High-risk individuals are excluded from work or day care until they have two consecutive negative stool cultures, bearing in mind that:

- No follow-up specimens shall be collected until the person is asymptomatic and at least 48 hours have passed since completion of antibiotic therapy (if any).
- Serial specimens must be collected at least 24 hours apart.

5.7 Protection of Contacts

Generally, via education only. Under extraordinary circumstances, antibiotic prophylaxis may be warranted. Consult with ACDP.

5.8 Environmental Measures

As indicated (see below).

6. MANAGING SPECIAL SITUATIONS

6.1 Case Attends or Works at a Day Care Facility

1. Interview the operator and check attendance records to identify other possible cases during the previous 30 days.
2. Instruct the operator and other staff in proper methods for food handling and hand washing, especially after changing diapers.
3. If other confirmed or suspected cases have occurred, collect stool specimens from all staff members and children who are symptomatic or who have had diarrhea during the previous 30 days.
4. If other possible cases are identified, do an environmental evaluation.
5. Instruct the operator to notify the LHD immediately if new cases of diarrhea occur. Call or visit once each week for two weeks after onset of the last case to verify that surveillance and appropriate preventive measures are being carried out. Manage newly symptomatic children as outlined above.
6. If more cases among children or staff members are identified than realistically can be excluded, work with the operator to develop a plan to physically separate (cohort) infected from uninfected children and staff. Such a program will have to be monitored closely.

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6.2 Case is a Food handler, or a Commercial Food Source Is Implicated

1. Visit the facility for a brief environmental evaluation and verify, by interviewing the operator and reviewing worker attendance records whether any employees have had a diarrheal illness within the past 30 days. Ask about any complaints of illness from patrons during this period.
2. Employees with a history of diarrhea within the past 30 days must submit a single stool specimen for culture. (Symptomatic employees should, of course, be excluded.)
3. The extent of further investigation depends on circumstances. Consult with ACDP.

6.3 Food Served at a Public Gathering Is Implicated

1. Determine whether anyone who prepared food for the gathering had diarrhea at any time during the previous 30 days. Determine whether any other food preparers or attendees developed diarrhea within 7 days after the gathering.
2. Collect stool specimens for culture from any food handlers with such histories. (This is mandatory if the individual works for a commercial food-service facility.)
3. The extent of further investigation depends on circumstances. Consult with ACDP.

6.4 Public Water Supply Implicated

Consult with ACDP.

UPDATE LOG

April 2018: Revised case definitions; various edits. (Shiferaw).

March 2016: Added culture independent test (CIDT) under §3. Revised suspect case definition. (Shiferaw).

December 2015: Placed into new template and corrected spelling and link errors. (Leslie Byster)

November 2014. Changes include: §3.4 - Definitions, Diagnosis, and Laboratory Services. Added stool must be placed into Cary-Blair within one hour of collection. Changed Microbiology Requisition Form from #75 to #60. §6.1.3 Managing Special Situations, where case attends day care, diarrhea from two months to one month. (Shiferaw and Vega).

September 2004. Created.