

Shigellosis

Investigative Guidelines

October 2021

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 the case transmitting infection to others, and to prevent such transmission.
3. To identify other undiagnosed or unreported cases.

1.2 Laboratory and Physician Reporting Requirements

Laboratories and physicians are required to report infections to the local health department (LHD) 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). Laboratories are encouraged to perform reflex culture for specimens positive by polymerase chain reaction (PCR) and to submit actively growing isolates. If reflex culture is not done, submit stool in enteric pathogen transport media.

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 creating a case in Orpheus within one working day of initial physician or laboratory report.
2. Begin follow-up investigation of confirmed and presumptive cases within one working day. Enter information directly into Orpheus or use the Shigellosis case report form to collect information before entering it into Orpheus: [Shigellosis Case Report Form](#).
All case data are automatically submitted to OHA ACDP electronically via the Orpheus application.
3. Ensure that laboratories forward the first isolate from each patient to OSPHL for species identification as required by Oregon Administrative Rule (333-018-0018).
4. For recognized outbreaks, consult with the OHA ACDP on-call epidemiologist to create an outbreak record and request any needed assistance. Complete

Shigellosis

summary of investigation in the Outbreaks database, consulting with the assigned OHA ACDP epidemiologist as needed. Submit report 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 in Oregon, followed by *S. flexneri*. There are typically one or two reports of *S. boydii* infections per year in Oregon. *S. dysenteriae* infections are even rarer in Oregon, but when they do occur are often serious, with a high case fatality rate. Outbreaks in 2020 and 2021 indicate that men who have sex with men and the homeless population are disproportionately affected by *S. sonnei* and *S. flexneri*.

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 nausea and vomiting. Illness is self-limited, usually lasting 3–10 days. Persistent (asymptomatic) carriage lasting weeks or months may occur, although it occurs 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. Recognized vehicles or mechanisms include:

1. Person-to-person transmission within households and day care facilities or among other close contacts whenever handwashing after defecation is inadequate (e.g., homeless encampments). Caregivers 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.

Shigellosis

7. Although there are no natural animal reservoirs, some nonhuman primates are susceptible to infection from infected humans and could become sources of infection for animal handlers or exotic pet owners.

2.5 Incubation Period

1–3 days; rarely, as short as 12 hours or up to 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 several months. The period of excretion is usually shortened by appropriate antimicrobial treatment.

2.7 Treatment

1. Fluid and electrolyte replacement, if indicated.
2. Treatment with antimicrobials to which the isolated strain is susceptible will shorten the duration of illness and period of communicability.
3. High levels of resistance to some antimicrobials (e.g., ampicillin and trimethoprim/sulfamethoxazole) have been found in Oregon. Treatment should be based on antimicrobial susceptibility testing.
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

Many laboratories are now using culture-independent diagnostic tests (CIDTs) such as PCR, which detect specific nucleic acid sequences of a bacterium. CIDTs that detect *Shigella* spp. will also detect enteroinvasive *E. coli* (EIEC) because of genetic similarities between these two groups; detection of *Shigella*/EIEC by CIDTs is considered evidence of a “presumptive” shigellosis case. Isolation of the organism by culture is necessary for confirmation of the case and serotyping. 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 OSPHL for confirmation and serotyping.

Laboratories that do not perform in-house reflex cultures 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”. Please proceed with investigation of cases with a PCR-positive test result and pending culture result (i.e., don’t wait for final culture result).

A case should not be counted as a new case if laboratory results are 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, a separate case should be created for each serotype.

3.1 Confirmed Case Definition

Anyone with *Shigella* spp. isolated from a clinical specimen.

Shigellosis

3.2 Presumptive Case Definition

Anyone with *Shigella* spp. or *Shigella*/EIEC detected in a clinical specimen by CIDT, and the reflex culture is negative, or not done.

OR

Compatible illness in someone epidemiologically linked to a confirmed or presumptive (CIDT-positive) case

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

OSPHL provides stool culture and isolate identification of *Shigella* spp. Serotyping is performed for public health purposes to identify the species and further characterize *S. flexneri*, *S. boydii*, *S. dysenteriae*. Whole genome sequencing (WGS) is performed for *S. sonnei* isolates for surveillance purposes. WGS may also be performed for *S. flexneri* isolates on request from state epidemiologists. *S. boydii* and *S. dysenteriae* isolates are forwarded to CDC for special studies.

Complete specimen acceptance criteria are available on the OSPHL Lab Test Menu at www.healthoregon.org/labtests. All specimens and isolates must be properly packaged and accompanied by a completed OSPHL General Microbiology Test Request Form, available at www.bitly.com/phl-forms.

For stool culture, submit stool in enteric pathogen transport media (e.g., Cary Blair). Store and transport specimens at refrigerated temperatures; specimens should be received by OSPHL within 24 hours of collection. Do not collect or transport specimens for receipt at OSPHL on a state holiday since specimen integrity may be compromised.

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

If follow-up specimens from the same case are submitted for return to work or school, indicate this on the Test Request Form. Follow-up specimens will not be tested without this information.

Note that stool specimens will not be cultured unless obtained before initiation of antimicrobial treatment, or after 48 hours have passed since discontinuation of antimicrobials. Refer to §5.6 for additional information on follow-up testing (test-of-cure).

4. ROUTINE CASE INVESTIGATION

4.1 Case Interview

1. Note whether patient is deceased (yes or no). Obtain clinical data: onset date, symptoms, and whether hospitalized overnight (ER visit alone does not count as hospitalization). If hospitalized please enter all hospitalization data (dates of admission and discharge, name of hospital, and discharge status).
2. For the 1 to 7 days before onset, determine:

Shigellosis

- 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.
- 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 OHA ACDP.
- Travel history (within Oregon, within the U.S, or outside the U.S.).
- Sexual contact involving potential fecal exposure.
- Whether the case has been homeless.

4.2 Identify Potentially Exposed Persons

Determine whether the case or any household members attend a day care facility; work in a sensitive occupation (i.e., day care worker, food handler, health care worker, or residential care provider); or served food at a public gathering. If any of these apply, 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 handwashing 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 handwashing after diaper changing and before food handling can be implemented. Exemption may

Shigellosis

also be considered if the affected child is of school age. Restrictions on confirmed or presumptive cases shall not be lifted until results of laboratory tests of two consecutive stool specimens collected not less than 24 hours apart are negative for *Shigella* (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 antimicrobial to which the isolate is susceptible and they have excellent personal hygiene. Otherwise, restrictions on confirmed or presumptive cases shall not be lifted until results of laboratory tests of two consecutive stool specimens collected not less than 24 hours apart are negative for *Shigella* (see §5.6). Individuals may return to work without restrictions once this requirement is met.

5.5 Restrictions on Household Contacts

None unless symptomatic and attending day care or working in a sensitive occupation.

5.6 Follow-up Testing of Stool Specimens

Routine follow-up testing of stool specimens is only indicated for high risk individuals (i.e., cases that are day care attendee or work in a sensitive occupation). Other symptomatic household members who attend day care or work in a sensitive occupation should be encouraged to seek medical attention and get stool testing from their regular health care providers.

Cases who are high-risk individuals are excluded from work or day care until they have two consecutive negative stool specimens. Any of the following results meets the definition of a negative follow-up test:

- No *Shigella* isolated on stool culture
- PCR-negative result for *Shigella*
- PCR-positive result for *Shigella* with negative reflex culture

Note: a PCR-positive result for *Shigella* with no reflex culture does not count as a negative test.

Bear 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 antimicrobial treatment (if any).
- Serial specimens must be collected at least 24 hours apart.

5.7 Protection of Contacts

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

Shigellosis

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 for the previous 30 days to identify other possible cases that may suggest an outbreak.
2. Instruct the operator and other staff in proper methods for food handling and handwashing, especially after changing diapers.
3. If other confirmed, presumptive, or clinically compatible cases have occurred, collect stool specimens for testing from all staff members and children who are symptomatic or who have had diarrhea during the previous 30 days. Symptomatic individuals should be excluded from the day care facility.
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 and staff as outlined in §6.1.3.
6. If more cases among children or staff are identified than can realistically be excluded, work with the operator to develop a plan to physically separate (cohort) cases from uninfected children and staff. Such a program will have to be monitored closely.

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

1. Visit the facility for a brief environmental evaluation and ascertain, by interviewing the operator and reviewing worker attendance records, whether any employees have had a diarrheal illness within the previous 30 days. Ask about any complaints of illness from patrons during this period.
2. Employees with a history of diarrhea within the previous 30 days must submit a stool specimen for testing. (Symptomatic employees should, of course, be excluded.)
3. The extent of further investigation depends on circumstances. Consult with OHA 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 or any other food preparers or attendees developed diarrhea within 7 days after the gathering. Collect stool specimens from any identified individuals.
2. The extent of further investigation depends on circumstances. Consult with OHA ACDP.

Shigellosis

6.4 Public Water Supply Implicated

Consult with OHA ACDP.

UPDATE LOG

October 2021: Updated to align with 2016 CSTE position statement; lab portions updated by OSPHL; various other edits (Trevejo, Morey, Hatch).

March 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.