Shigellosis
Investigative Guidelines
October 2016

1. DISEASE REPORTING

1.1 Purpose of Reporting and Surveillance

1. To determine if 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 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 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 type reported in Oregon. *S. dysenteriae* infections are rare in Oregon, but when they do occur
Shigellosis

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

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 have started using culture-independent diagnostic tests (CIDTs), which detect the presence of a specific antigen (e.g., direct florescent antibody tests) or genetic sequence of a bacterium (PCR). However, if no culture is done, we will have no subtyping for public health purposes. If PCR is positive for *Shigella*, laboratories in Oregon will do reflex culture. If PCR is positive, but the culture is negative, the case will be a suspect case. When you get a PCR positive test before the culture result, please proceed to interview the case, because most of them will turn out to be culture-positive — i.e., true cases. If you get the culture result before the interview, and it is negative, you do not need to interview the case, because this it will remain merely suspect.

3.1 Confirmed Case Definition

Anyone with culture evidence of *Shigella* from any site.

3.2 Presumptive Case Definition

Compatible illness in someone epidemiologically linked to a confirmed case

3.3 Suspect Case (not reportable to PHD)

Anyone with an undiagnosed febrile diarrheal illness or someone with PCR positive test, but is culture negative.

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

OSPHL provides isolate identification, serotyping, and stool culturing for *Shigella* species. For isolate identification, submit a pure isolate of the organism growing on an agar slant that will support growth (e.g., nutrient or blood agar). A stool sample submitted in Cary-Blair is required for stool culturing (stool must be placed into Cary-Blair within one hour of collection). Specimens may be sent without a cold pack. All specimens must be properly packaged in double containers with absorbent material around them. Use the microbiology requisition form (#60).

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 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.

4.2 Identify Potentially Exposed Persons
   Determine if 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, 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.
Shigellosis

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. Exclusion can be ended after two consecutive negative stool cultures (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. 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. 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. Individuals may return to work without restrictions after two consecutive negative stool cultures (see §5.6).

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, 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.

6.2 Case is a Food handler or a Commercial Food Source 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 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.
Shigellosis

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 the ACDP

6.4 Public Water Supply Implicated
Consult with the ACDP.

UPDATE LOG

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).