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## Case Definition - [Shigellosis – 2017 Case Definition](#)

### Overview

- **Agent** - There are four *Shigella* species: Group A: *Shigella dysenteriae*, Group B: *Shigella flexneri*, Group C: *Shigella boydii*, Group D: *Shigella sonnei*
- **Reservoir** – The only significant reservoir is humans, although prolonged outbreaks have occurred in primate colonies.
- **Occurrence** – *Shigella* causes about 450,000 illnesses in the United States and 269 million illnesses worldwide annually. *Shigella sonnei* is the most common species reported in the United States. *S. dysenteriae* and *S. boydii* continue to be important causes of disease in sub-Saharan Africa and South Asia.
- **Environment** – *Shigella* species can survive in water for up to six months, on dry surfaces for up to five months, and in food for up to 30 days. Chlorination of water, if appropriately maintained, will remove the threat of infection.
- **Risk Factors** - In the United States, children younger than five years are at increased risk for shigellosis outbreaks, especially young children in childcare setting, schools, and their family members. Outbreaks can also occur among individuals in custodial institutions, where personal hygiene is difficult to maintain, international travelers, and men who have sex with men.
- **Mode of Transmission** – *Shigella* has a low infectious dose as ingestion of as few as 10-100 organisms is sufficient to cause infection. Transmission primarily occurs by direct or indirect fecal-oral transmission from a symptomatic patient or asymptomatic carrier. Transmission can occur via:
  - Person-to-person transmission within households and childcare facilities or to other close contacts.
  - Sexual activity by contact with feces from an infected partner.
  - Inanimate objects contaminated with feces (fomites).
  - Food contaminated during harvest, transportation, preparation, or serving, mainly food served without cooking (e.g., lettuce, cold sandwiches).
  - Contaminated and inadequately treated drinking water or through the ingestion of contaminated and untreated recreational water.
  - Houseflies and cockroaches also may be vectors through physical transport of infected feces.
- **Period of Communicability** - *Shigella* bacteria are present in the diarrheal stools of infected persons and generally can be excreted in feces for one to four weeks in persons without antimicrobial therapy. Transmission can occur as long as the bacteria are present in the feces. Asymptomatic carrier excretion may persist for months.
- **Incubation Period** – Usually one to three days, but may range from 12 to 96 hours and up to one week for *Shigella dysenteriae* type 1.
- **Clinical Illness** – Most people with shigellosis will develop an acute onset of diarrhea, bloody diarrhea, fever, stomach cramps, and sometimes nausea or vomiting. The illness is typically self-limiting, lasting an average of four to seven days. A severe infection with

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high fever may be associated with seizures in children under two years old. Asymptomatic infections occur though these persons are still infectious to others. Bacillary dysentery caused by *Shigella dysenteriae* 1 is a very serious disease that can cause [Hemolytic uremic syndrome](#) (HUS) in patients because of the virulent shiga-toxin that it produces.

- **Laboratory Testing** – Shigellosis is diagnosed by isolation of the organism from bacterial culture, polymerase chain reaction (PCR), or culture-independent diagnostic tests (CIDTs) of stool specimens. Culture confirmation of CIDT-positive specimens is ideal. CIDT results for *Shigella* are often combined with a genetically similar bacterium called Enteroinvasive Escherichia coli (EIEC). Isolates are essential for species identification, whole genome sequencing (WGS), outbreak detection and antimicrobial susceptibility testing. Antimicrobial susceptibility testing is increasingly important because of substantial multidrug resistance among *Shigella*.
- **Treatment** – Shigellosis can be mild and usually resolves within five to seven days without treatment. Supportive care alone, fluid and electrolyte replacement (oral or IV) is the mainstay of treatment for patients with shigellosis. However, antimicrobial treatment given early in the course of illness can shorten duration of symptoms, carriage, and possibly shortening the period of communicability. Antibiotic treatment is recommended for patients with severe disease, bloody diarrhea, dysentery, or underlying immunosuppressive conditions. Treatment may also be recommended to mitigate or prevent outbreaks in certain high-risk settings.
- **Priority** – Prompt investigation and implementation of control measures are required.

### **Quick References / Factsheets**


- Fact Sheet: [Shigellosis](#)
- Public - [Shigellosis Questions and Answers for the Public \(CDC\)](#)
- Health Professionals - [Shigellosis Questions and Answers for Health Professionals \(CDC\)](#)
- [Shigella Prevention and Control Toolkit](#)

### **Forms**

- Disease Case Report (CD-1) [PDF format](#) [Word format](#)
- [Record of Investigation of Enteric Illness \(CD-2C\)](#)
- [Missouri Outbreak Report Form \(MORF\)](#)
- [Child Care Establishment Inspection Related to Enteric Infection \(CD-8\)](#)

### **Notifications**


- Contact the [District Epidemiologists](#) or the Missouri Department of Health and Senior Services (MDHSS) – Bureau of Communicable Disease Control and Prevention (BCDCP), phone (573) 751-6113, or for afterhours notification contact the MDHSS - Emergency Response Center (ERC) at (800) 392-0272 (24/7) immediately if a case of shigellosis is in a high-risk setting or job such as food handling, childcare or health care, or if an outbreak of shigellosis is suspected.

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- If a case(s) is associated with a childcare center, BCDCP or the LPHA will contact the MDHSS - Bureau of Environmental Health Services, phone (573) 751-6095, Fax (573) 526-7377 and Missouri Department of Elementary & Secondary Education (DESE) Office of Childhood/Child Care Compliance, phone (573) 751-2450, Fax (573) 526-5345.
- If a case(s) is associated with a food handler, BCDCP or the LPHA will contact the MDHSS – Bureau of Environmental Health Services, phone (573) 751-6095, Fax (573) 526-7377.
- If a case(s) is associated with a long-term care facility, BCDCP or the LPHA will contact the MDHSS - Section for Long Term Care Regulation, phone (573) 526-8524, Fax (573) 751-8493.
- If a case(s) is associated with a hospital, hospital-based long-term care facility, or ambulatory surgical center, BCDCP or the LPHA will contact the MDHSS - Bureau of Health Services Regulation phone (573) 751-6303, Fax (573) 526-3621.
- If a case(s) is associated with a public water supply, contact the Department of Natural Resources, Public Drinking Water Branch, at (573) 751-1187, Fax (573) 751-3110, or if a case(s) is associated with a private water supply, contact the MDHSS – Bureau of Environmental Health Services, phone (573) 751-6095, Fax (573) 526-7377.

### **Reporting Requirements**

- Shigellosis is a Category 2 (A) disease and shall be reported to the local health authority or to the MDHSS within one (1) calendar day of first knowledge or suspicion; for afterhours notification contact the MDHSS - ERC at (800) 392-0272 (24/7).
- Shigellosis is a nationally notifiable condition in the standard reporting category. The MDHSS reports confirmed shigellosis cases to the CDC by routine electronic transmission.
- Shigellosis reporting includes the following:
  1. For all cases, complete a “[Disease Case Report](#)” (CD-1).
  2. For confirmed and probable cases, complete the “[Record of Investigation of Enteric Infection](#)” (CD-2C).
  3. MDHSS will use information collected from the [Missouri Outbreak Report Form \(MORF\)](#) to complete a [National Outbreak Reporting System Report](#) in the case of an outbreak associated with food, water, person-to-person transmission, environmental contamination, animal contact, or indeterminate/other/unknown etiology.
  4. All outbreaks or suspected outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the District Epidemiologists.
  5. Within 90 days from the conclusion of an outbreak, submit the Missouri Outbreak Report Form (MORF) and/or a formal outbreak report to the [District Epidemiologists](#).

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### **Laboratory Testing and Diagnosis**

Identification of *Shigella* requires the collection of a fecal specimen as early in the course of the illness as possible and before antibiotic therapy begins. Blood specimens and rectal swab specimens are not acceptable specimens for analysis by the Missouri State Public Health Laboratory (MSPHL).

- **Culture and WGS or next generation sequencing:** Shigellosis disease is typically diagnosed by isolation of *Shigella* from a stool sample. However, sensitivity of bacterial culture may be low, particularly when performed after initiation of antibiotic therapy.
- **Polymerase chain reaction (PCR) or CDT:** Real-time PCR detects DNA of *Shigella* in a stool clinical specimen. Although culture remains the gold standard for diagnosis of shigellosis in the United States, PCR is useful for detection of *Shigella* from clinical samples in which the organism could not be detected by culture.


The MSPHL performs culturing and identification of *Shigella* species. Testing for *Shigella* at MSPHL should be coordinated through the Microbiology Unit (573) 751-3334 before specimen submission <https://health.mo.gov/lab/enterics.php>.

**Note:** The search for unrecognized mild cases (without diarrhea) and convalescent carriers among contacts may be unproductive, and seldom contributes to the control of an outbreak. Cultures of contacts should generally be confined to food employees, attendants and children in hospitals, child care and other situations where the spread of infection is likely.

**Note:** *Shigella* species are frequently resistant to antibiotics. Antibiotic sensitivity testing, while not performed by the MSPHL, is routinely available through commercial labs and is indicated because resistance to antimicrobial agents is common and susceptibility data can guide appropriate therapy.

### **Conducting the Investigation**

1. **Verify the diagnosis.** Contact physician, hospital and/or laboratory as needed to obtain demographic, clinical and laboratory information needed to verify diagnosis and to proceed with the investigation
2. **Identify potential sources of exposure.** Contact the case and ask about potential exposures from one week to 12 hours before onset of illness, including:
  - Contact with diapered children, with children in child care or other settings for preschool children, or with staff of these facilities.
  - The case or household contact working as a food handler or healthcare provider.
  - Travel to an area where shigellosis is known to be endemic or where there is a known outbreak occurring.
  - Sexual practices or other activities that may place a person at increased risk of infection.


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3. **Review surveillance data.** Determine whether there have been other cases in the same geographic area or institution. When cases are related by person, place, or time, efforts should be made to identify a common source.
4. **Provide shigellosis information to persons at risk for infection and the general public as needed.** Efforts should be made to promote shigellosis awareness and provide prevention information to the public to reduce the risk of shigellosis. Meticulous hand hygiene is the single most important measure to decrease transmission. Information on shigellosis prevention can be found on CDC’s website at: <https://www.cdc.gov/shigella/prevention-control.html>.

### **Control Measures (General Setting)**

Currently, no vaccines are available for shigellosis. The best defense against shigellosis is thorough, frequent handwashing, improved sanitation, appropriately chlorinating the water supply, proper cooking and storage of food. Attention to hand hygiene is essential to limit spread of *Shigella*. Wash hands properly, including under fingernails, with soap carefully and frequently, especially after going to the bathroom, changing diapers, and before preparing food, beverages, or caring for children or patients. Additional recommendations and control measures include:

- Dispose of soiled diapers in a covered, lined garbage can. Wash, rinse and sanitize diaper-changing areas after using them.
- Supervise handwashing of toddlers and small children after they use the toilet.
- Keep children with diarrhea out of child care settings.
- Daycare centers should not provide shared water-play areas.
- Breastfeeding provides some protection for infants.
- Travelers should follow [food and water precautions](#).
- Do not prepare food for others while ill with diarrhea.
- Shigellosis cases and ill contacts should be excluded from food handling, the care of children or patients, and other occupations or activities that pose significant risk of transmission until diarrhea ceases and appropriate medical documentation is provided showing the person is free of *Shigella* based on test results (See Control Measures Special Setting for specific guidance for individuals working in food, childcare, and in a healthcare setting).
- Avoid swallowing water from ponds, lakes, or swimming pools.
- Infected persons should refrain from recreational water venues (e.g. swimming pools, water parks, interactive fountains, lakes) until after symptoms resolve. Individuals who are incontinent should avoid recreational water activities for at least one additional week after symptoms resolve.
- Sexually active people should avoid engaging in sexual activity for at least two weeks after resolution of diarrhea.
- Prompt case reports to public health authorities by health care providers are essential.

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**Note:** *Shigella* bacteria are present in the stools of infected persons and generally can be excreted in feces for one to four weeks in persons without antimicrobial therapy. Transmission can occur as long as the bacteria are present in the feces.

**Note:** Identification of *Shigella dysenteriae* type 1 that is antibiotic resistant, requires an enhanced response (comparable to typhoid fever) due to a potentially high case-fatality rate in those infected.

### **Control Measures (Special Settings)**


#### ***Shigellosis Case in a Food Handler:***

1. Obtain specific information about the infected food handler including, but not limited to,
  - Symptoms and onset dates including if the case had diarrhea and if so, onset date, while at work, etc.
  - Obtain the patient’s exact work duties and schedule during the infectious period. Define the dates and times case worked as accurately as possible (check timesheets).
2. Food handlers with shigellosis should be excluded from food handling until at least one of the following conditions is met:
  - Test results showing two (2) consecutive negative stool specimen cultures that are taken no earlier than forty-eight (48) hours after discontinuance of antibiotics and at least twenty-four (24) hours apart, or
  - Has been asymptomatic for more than seven (7) calendar days, or
  - Did not develop symptoms and more than seven (7) calendar days have passed since the food employee was diagnosed.
3. A food employee exposed to, or is the suspected source of, a confirmed foodborne disease outbreak because they consumed or prepared food implicated in the outbreak; consumed food at an event or food establishment prepared by a person infected or ill with an illness listed in this section; attended or worked in a setting where there is a confirmed foodborne disease outbreak; is living in the same household as, and has knowledge about an individual who works or attends a setting where there is a confirmed foodborne disease outbreak; or living in the same household as, and has knowledge about, an individual diagnosed with an illness caused by *Shigella spp.* should be restricted from food handling and reinstated when one of the following conditions is met:
  - More than three (3) calendar days have passed since the last day the food employee was potentially exposed, or
  - More than three (3) calendar days have passed since the food employee’s household contact became asymptomatic.

**Note:** For additional guidance regarding shigellosis in a food handler, see the [Missouri Food Code](#).

#### ***Shigellosis Case in a Child Care Center:***


Shigellosis outbreaks involving groups of young children, especially those who are not yet toilet trained, can be difficult to control. Due to the potential for rapid spread in the child care setting, special measures are recommended when shigellosis is diagnosed in an attendee

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or employee of a child care facility. Increased surveillance within the child care facility to identify others with diarrheal illness is essential.

1. Emphasize handwashing. Because good hand hygiene is the best preventive measure, supervised handwashing after visiting the bathroom and before eating is essential for all children. Waterless hand sanitizers may also be helpful as an adjunct to washing hands with soap and water.
2. If several cases occur in a daycare center, the local public health agency should coordinate efforts to improve handwashing among the staff, children, and their families.
3. Employees handling food in child care settings are subject to the same requirements and guidance outlined in the Shigellosis Case in a Food Handler section above. For additional guidance, refer to the [Missouri Food Code](#).
4. Staff who prepares food should not change diapers, or assist children in using the toilet.
5. If a child in diapers has shigellosis, everyone who changes the child's diapers should be sure the diapers are disposed of properly in a closed-lid garbage can, and should wash his or her hands and the child's hands carefully with soap and warm water immediately after changing the diapers. After use, the diaper changing area should be wiped down with a disinfectant such as diluted household bleach or other appropriate bactericidal wipes.
6. Other surfaces and objects should be decontaminated regularly; daily during an outbreak of shigellosis. Consider creating a schedule that helps staff routinely clean and disinfect surfaces and objects.
7. Access to shared water-play areas and contaminated diapers should be eliminated.
8. Centers should avoid new admissions when shigellosis has been identified and transmission has been epidemiologically linked to the center.
9. All symptomatic persons (employees and children) should be excluded from the childcare setting in which *Shigella* infection has been identified, until diarrhea has ceased for 24 hours; and one (1) stool culture is free of *Shigella spp.*; specimens should not be obtained earlier than 48 hours after discontinuation of antibiotics.
10. Infected persons should refrain from recreational water venues (e.g. swimming pools, water parks) while symptomatic.
11. Contact the Missouri Department of Elementary & Secondary Education (DESE) Office of Childhood/Child Care Compliance for an Environmental Public Health Specialist to perform an assessment of the childcare facility. The inspection should include emphasis on the items listed in [“Child Care Establishment Inspection Related to Enteric Infection”](#) (CD-8). The CD-8 form is not intended to replace the routine Child Care Establishment Inspection Form. The CD-8 is a check-list used to assist with the evaluation of the facility.
12. To prevent the spread of infection, efforts should be made to avoid the transfer of children to other child care centers. Closure of affected child care centers may lead to placement of infected children in other centers (with subsequent transmission in those centers) and is counterproductive. If several persons are infected, a cohort



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system can be considered until one negative stool culture shows the person is free of shigellosis and can be returned to normal care.

***Shigellosis Case in a Health Care Provider:***


Infected health care workers and ill contacts should be excluded from patient care, and other occupations that pose significant risk of transmission, until diarrhea ceases for 24 hours and obtain 2 consecutive negative stool cultures; not earlier than 48 hours after discontinuation of antibiotics, and at least 24 hours apart. In residential institutions ill residents, if possible, should be housed in separate areas. Newly admitted residents should not be housed in areas with ill residents.

***Shigellosis Case in a School or Preschool:***

In the school setting, hand hygiene is the most important control measure. Teachers and students with any diarrheal illness should be excluded from the school until 24 hours after their diarrhea has ceased. If an outbreak in a school cannot be controlled with improved hygiene and exclusion of those with diarrhea, then additional intervention may be necessary.

**Resources**

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10. Missouri Department of Health and Senior Services. 19 CSR 30-62--Health. Chapter 62--Licensing Rules for Group Day Care Homes and Child Day Care Centers. <http://www.sos.mo.gov/adrules/csr/current/19csr/19c30-62.pdf> (3/19).