

# SHIGELLOSIS

## REPORTING INFORMATION

- **Class B:** Report by the end of the next business day after the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Reporting Form(s) and/or Mechanism: The Ohio Disease Reporting System (ODRS) should be used to report lab findings to the Ohio Department of Health (ODH). For healthcare providers without access to ODRS, you may use the [Ohio Confidential Reportable Disease Form](#) (HEA 3334, rev. 1/09). The [Ohio Enteric Case Investigation Form](#) may be useful in the local health department follow-up of cases. Do not send this form to the Ohio Department of Health (ODH); information collected from the form should be entered into ODRS where fields are available and the form should be uploaded in Administration section of ODRS. Because all of the fields are available in ODRS, the form no longer needs to be sent to the Ohio Department of Health (ODH).
- Key fields for ODRS reporting include: sensitive occupation (e.g., direct patient care, child care provider, food handler), sensitive setting (e.g., day care or preschool attendee, long term care facility resident), and date of illness onset.

## AGENT

*Shigella sonnei* (also known as group D) accounts for most shigellosis cases in Ohio. *S. flexneri* (group B), *S. dysenteriae* (group A) and *S. boydii* (group C) can also cause human illness.

### Infectious Dose

The infectious dose may be very small, 10-100 organisms.

## CASE DEFINITION

### Clinical Description

An illness of variable severity characterized by diarrhea, fever, nausea, cramps and tenesmus. Asymptomatic infections may occur.

### Laboratory Criteria for Diagnosis

Suspect: Detection of *Shigella* from a clinical specimen using a non-culture based method.

Confirmed: Isolation of *Shigella* from a clinical specimen.

### Case Classification

Suspect: A case that meets the suspect laboratory criteria for diagnosis.

Probable: A clinically compatible case that is epidemiologically linked to a confirmed case.

Confirmed: A case that meets the laboratory criteria for diagnosis. When available, O antigen serotype characterization should be reported.

**Comment**

Both asymptomatic infections and infections at sites other than the gastrointestinal tract, if laboratory confirmed, are considered confirmed cases that should be reported.

**SIGNS AND SYMPTOMS**

An acute gastrointestinal illness characterized by diarrhea, fever, abdominal pain, malaise and sometimes vomiting. Typically, there is blood and mucous in the stool. Mild and asymptomatic infections occur, and illness is usually self-limited and lasts 4-7 days on average.

**DIAGNOSIS**

Shigellosis is diagnosed by means of stool culture. Most hospital laboratories have the ability to identify *Shigella*. ODH Laboratory performs testing for *Shigella*. In some circumstances, testing can be done at the ODH Laboratory without charge. To obtain the fee exemption and to arrange for receipt of the stool transport kit, contact the ODH Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599. If testing is to be performed at the ODH Laboratory, use Cary Blair transport media.

**EPIDEMIOLOGY****Source**

Humans are the reservoir of *Shigella*. Food contaminated with human feces may be a source of infection. Contamination may occur in the field or in the kitchen.

**Occurrence**

Shigellosis occurs worldwide. Communities in developed countries can experience prolonged outbreaks. There is no strong seasonal pattern. Most recognized cases occur in children <10 years of age. However, all ages are at risk.

**Mode of Transmission**

*Shigella* is usually transmitted directly person-to-person by the fecal-oral route. Food served raw or contaminated after cooking can serve as a vehicle for *Shigella*. Swimming in contaminated recreational water (e.g. lakes, beaches) is another way to acquire shigellosis. The low infectious dose facilitates transmission by these routes.

**Period of Communicability**

The organism is shed in the stool throughout the acute illness and possibly for up to one month. The asymptomatic carrier state may occur.

**Incubation Period**

The incubation period is 12-96 hours, usually 1-3 days.

**PUBLIC HEALTH MANAGEMENT****Case**Investigation

All cases reported to the local health department should initially be followed up with a telephone call to obtain demographic and epidemiologic data. No further work-up is recommended if neither the case nor any household member is employed in a sensitive occupation (food handler, healthcare worker, employee in a child care center who handles food or directly cares for children) or attends a child care center, unless there is evidence that the case is part of an outbreak.

If the case attends a child care center or works in a sensitive occupation, then that case is excluded from the child care center or work in a sensitive occupation, and may return when diarrhea has ceased and after 2 consecutive stools are negative for *Shigella* (see Isolation Requirement for shigellosis).

### Treatment

Persons with mild infections usually recover quickly without antibiotic treatment. However, appropriate antibiotic treatment can shorten the duration of diarrhea due to shigellosis, and can eradicate the organism from feces. Antibiotic treatment is recommended for patients with severe disease, bloody diarrhea or compromised immune systems. The antibiotic sensitivity of the patient's isolate should be determined, and the patient should be treated with the appropriate antibiotic. Most strains are resistant to ampicillin. Resistance to Bactrim (trimethoprim-sulfamethoxazole or TMP-SMX) is becoming more common. Parenteral ceftriaxone, a fluoroquinolone (such as ciprofloxacin) or azithromycin may be given if susceptibility is unknown, or there is resistance to both ampicillin and TMP-SMX. Antidiarrheal agents such as loperamide (Imodium®) or diphenoxylate with atropine (Lomotil®) can make the illness worse and should be avoided.

### Isolation and Follow-up Specimens

Ohio Administrative Code (OAC) 3701-3-13 (X) states:

"Shigellosis: a person with shigellosis who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return if diarrhea has ceased and after two consecutive follow-up stool specimens are negative for *Shigella*."

Obtain the first specimen at least 48 hours after cessation of diarrhea or, if being treated, at least 48 hours after completion of antibiotic therapy. Obtain the remaining specimen(s) at least 24 hours apart.

### **Contacts**

#### Household Contacts:

If any household contacts of the case attend child care or work in a sensitive occupation, determine if they have had diarrhea in the past week (that is, the seven days prior to the interview). If any of these household contacts have had diarrhea in the past week, two stool samples should be tested for *Shigella*. This testing can be done locally or at the ODH Lab. They should not be excluded while the testing is underway, unless they are **currently** having diarrhea, in which case they should be excluded from child care or work if the Isolation Requirement for Diarrhea applies (see OAC 3701-3-13 (H)). The purpose of this testing is to verify they are not shedding *Shigella* as they are a close contact of a shigellosis case, and in a high-risk setting.

#### Child Care Center Contacts:

If the case attends or works in a child care center, determine if any of the direct classroom contacts have had diarrhea in the past week (that is, the seven days prior to the interview). If any of the direct classroom contacts have had diarrhea in the past week, two stool samples should be tested for *Shigella*. This testing can be done locally or at the ODH Lab. They should not be excluded while the testing is underway, unless they are **currently** having diarrhea, in which case they should be excluded from the child care center if the Isolation Requirement for Diarrhea applies (see OAC 3701-3-13 (H)). The purpose of this testing is to verify they are not shedding *Shigella* as they are a close contact of a shigellosis

case, and in a high-risk setting.

### **Prevention and Control**

Education of the case and case contacts on the importance of hand washing can help limit the spread of shigellosis. Thorough hand washing should be emphasized, especially after bowel movements, after changing diapers and before eating or preparing food.

#### Food Handlers

Symptomatic persons should be excluded from work. As detailed in Isolation, above, food handlers may only return to work after diarrhea has ceased and two consecutive stool samples are negative for *Shigella*.

Food Service Operation rules also pertain to this situation. Shigellosis is a disease which can be transmitted through food. Persons infected with a disease that is communicable by food are not permitted to work as a food handler. For additional information, refer to Ohio Administrative Code (OAC) Chapter 3717-1 (Ohio Uniform Food Safety Code) Section 02.1, Management and Personnel: Employee Health.

#### Healthcare Workers, Child Care Workers and Children who Attend Child Care Centers

Symptomatic persons shall be excluded from work. As detailed in Isolation above, persons in these sensitive occupations and children who attend child care centers may return when diarrhea has ceased and two consecutive stool samples are negative.

#### Child Care Center Outbreak Control

When a case of shigellosis is laboratory-confirmed in a person who works in or attends a child care center, that person is excluded until diarrhea has ceased and two consecutive stools are negative per OAC 3701-3-13. In these situations, there should be a high index of suspicion of shigellosis should any cases of diarrhea be reported among children or staff of the entire child care center. Also, it is **recommended** that classroom contacts (children and adults) of the laboratory-confirmed case be screened with two stool samples using Cary Blair medium if they were symptomatic in the past week. Child care center workers or attendees with diarrhea (of infectious or unknown cause) are not permitted to attend the child care center per OAC 3701-3-13 (H), which states:

“Diarrhea, infectious or of unknown cause: a person with diarrhea, of infectious or unknown cause, who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return only after diarrhea has ceased. A person with infectious diarrhea of known cause shall be isolated in accordance with the provisions of the rule set forth for the specified disease.”

“ ‘Sensitive occupation’ means direct food handling, direct patient care, the handling of food or provision of direct care to children in a child care center, or any other occupation which provides significant opportunity for an infected individual to transmit infectious disease agents” per OAC 3701-3-01 (X).

SHIGELLA: Summary of Exclusion and Screening Guidelines:

(Everything in **bold** below is Ohio Administrative Code. Everything else is a recommendation from the Infectious Disease Control Manual.)

1. Does the case attend a child care center or work in a sensitive occupation?  
**If Yes, the case is excluded from the child care center or work, and may return if diarrhea has ceased and after 2 consecutive stools are negative for Shigella.** (See the Shigellosis Isolation Requirement, OAC.)
  
2. Does any household contact of the case attend child care or work in a sensitive occupation?  
If Yes, has that contact been ill with diarrhea in the past week\*?  
If Yes, that person should submit two stool samples for *Shigella* testing.  
**(If currently having diarrhea, they are excluded from their sensitive occupation or child care.** See Diarrhea Isolation Requirement, OAC. If they are not currently having diarrhea, they do not need to be excluded.)
  
3. Does the case attend or work in a child care center?  
If Yes, has anyone among direct contacts at the child care center been ill with diarrhea in the past week\*?  
If Yes, that person should submit two stool samples for *Shigella* testing.  
**(If currently having diarrhea, they are excluded from child care.** See Diarrhea Isolation Requirement, OAC. If they are not currently having diarrhea, they do not need to be excluded.)

\*"in the past week" means in the seven days prior to the day the question is asked.

Here are the relevant sections from the Ohio Administrative Code:

3701-3-01 Definitions

(X) "Sensitive occupation" means direct food handling, direct patient care, the handling of food or provision of direct care to children in a child care center, or any other occupation which provides significant opportunity for an infected individual to transmit infectious disease agents.

3701-3-13 Isolation Requirement

(H) Diarrhea, infectious or of unknown cause: a person with diarrhea, of infectious or unknown cause, who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return only after diarrhea has ceased. A person with infectious diarrhea of known cause shall be isolated in accordance with the provisions of the rule set forth for the specified disease.

(X) Shigellosis: a person with shigellosis who attends a child care center or works in a sensitive occupation shall be excluded from the child care center or work in the sensitive occupation and may return if diarrhea has ceased and after two consecutive follow-up stool specimens are negative for *Shigella*.

## SAMPLE LETTER TO PARENTS/GUARDIAN

Dear Parents/Guardian:

A case of shigellosis has occurred in your child's classroom. Shigellosis is a highly infectious diarrheal disease caused by a certain type of bacteria. The *Shigella* bacteria are present in the bowel movements of infected persons.

Persons become infected only by swallowing the bacteria. Spread occurs easily among groups of small children because of their close contact and lack of well-developed personal hygiene skills. Shigellosis usually begins about 1-7 days after the bacteria are swallowed. Frequent and thorough hand washing is helpful in preventing spread of shigellosis.

We have made arrangements with the Ohio Department of Health for free shigellosis screening of symptomatic children in his or her classroom. We urge you to take advantage of this opportunity because it will help prevent further spread of the illness in your household and at the school.

In order to find out if your child has shigellosis, please collect a stool specimen from your child, which will be submitted to the laboratory. The materials needed to do this are included with this letter. You should have a screw-capped tube partially filled with liquid.

Directions:

- Make sure the patient information section on the side of the vial is completed.
- Pass the stool into a clean, dry, container such as a margarine tub, wide mouth jar, milk carton with the top cut off or if available a bedpan.
- Use the collection spoon built into the lid of the vial to place small scoops of the stool into the vial until the contents of the vial rise to the "FILL LINE" on the vial label.
- For best results, select areas of the stool that appear bloody or watery. If the stool is formed (hard), sample small amounts from each end and the middle.
- When sufficient stool is added to raise the level to the "FILL LINE", replace and twist the cap onto the vial to tightly close.
- Once the cap is tight, shake the vial vigorously until the contents are well-mixed.
- Wash your hands thoroughly after collection of the specimen.
- Place the properly labeled vial into a zip-lock plastic specimen bag or other leak-proof container. Do not place the specimen paperwork unprotected within the same zip-lock bag or container with the vial to prevent contamination should the sample leak.
- Return the sample and paperwork immediately to your local health department or location as instructed when you were given the collection kit.
- Store and transport at room temperature.

Thank you for your cooperation. If you have any questions, please contact (RN) at the (local) Health Department, (telephone number).

Sincerely,

\_\_\_\_\_ Child Care Center      \_\_\_\_\_ Local Health Department

**What is shigellosis?**

Shigellosis is an infectious disease caused by a group of bacteria called *Shigella*. Most people who are infected with *Shigella* develop diarrhea, fever and stomach cramps starting a day or two after they are exposed to the bacterium. The diarrhea is often bloody. Shigellosis usually resolves in 5 to 7 days. In some persons, especially young children and the elderly, the diarrhea can be so severe that the patient needs to be hospitalized. A severe infection with high fever may also be associated with seizures in children less than 2 years old. Some persons who are infected may have no symptoms at all, but may still pass the *Shigella* bacteria to others.

**What sort of germ is *Shigella*?**

The *Shigella* germ is actually a family of bacteria that can cause diarrhea in humans. They are microscopic living creatures that pass from person-to-person. *Shigella* was discovered over 100 years ago by a Japanese scientist named Shiga, for whom they are named. There are several different kinds of *Shigella* bacteria: *Shigella sonnei*, also known as "Group D" *Shigella*, accounts for over two-thirds of the shigellosis in the United States. A second type, *Shigella flexneri*, or "group B" *Shigella*, accounts for almost all of the rest. Other types of *Shigella* are rare in this country, although they continue to be important causes of disease in the developing world. One type found in the developing world, *Shigella dysenteriae* type 1, causes deadly epidemics there.

**How can *Shigella* infections be diagnosed?**

Many different kinds of diseases can cause diarrhea and bloody diarrhea, and the treatment depends on which germ is causing the diarrhea. Determining that *Shigella* is the cause of the illness depends upon laboratory tests that identify *Shigella* in the stools of an infected person. These tests are sometimes not performed unless the laboratory is instructed specifically to look for the organism. The laboratory can also do special tests to tell which type of *Shigella* the person has and which antibiotics, if any, would be best to treat it.

**How can *Shigella* infections be treated?**

Shigellosis can usually be treated with antibiotics. Most strains are resistant to ampicillin and resistance to Bactrim (trimethoprim-sulfamethoxazole or TMP-SMX) is becoming more common. Parenteral ceftriaxone, a fluoroquinolone (such as ciprofloxacin) or azithromycin may be given if susceptibility is unknown, or there is resistance to both ampicillin and TMP-SMX. Appropriate treatment kills the *Shigella* bacteria that may be present in the patient's stools and shortens the illness. Unfortunately, some *Shigella* bacteria have become resistant to antibiotics, and using antibiotics to treat shigellosis can actually make the germs more resistant in the future. Persons with mild infections will usually recover quickly without antibiotic treatment. Therefore, when many persons in a community are affected by shigellosis, antibiotics are sometimes used selectively to treat only the more severe cases. Antidiarrheal agents such as loperamide (Imodium) or diphenoxylate with atropine (Lomotil) are likely to make the illness worse and should be avoided.

### **Are there long-term consequences to a *Shigella* infection?**

Persons with diarrhea usually recover completely, although it may be several months before their bowel habits are entirely normal. About 2% of persons who are infected with one type of *Shigella*, *Shigella flexneri*, will later develop pains in their joints, irritation of the eyes and painful urination. This is called Reiter's syndrome. It can last for months or years and can lead to chronic arthritis, which is difficult to treat. Reiter's syndrome is caused by a reaction to *Shigella* infection that happens only in people who are genetically predisposed to it. Once someone has had shigellosis, he or she is not likely to get infected with that specific type again for at least several years; however, infection with other types of *Shigella* is still possible.

### **How do people catch *Shigella*?**

The *Shigella* bacteria pass from one infected person to the next. *Shigella* are present in the diarrheal stools of infected persons while they are sick and for a week or two afterwards. Most *Shigella* infections are the result of the bacterium passing from stools or soiled fingers of one person to the mouth of another person. This happens when basic hygiene and hand washing habits are inadequate and can happen during certain types of sexual activity. It is particularly likely to occur among toddlers who are not fully toilet-trained. Family members and playmates of such children are at high risk of becoming infected.

*Shigella* infections may be acquired from eating contaminated food. Contaminated food may look and smell normal. Food may become contaminated by infected food handlers who forget to wash their hands with soap after using the bathroom. Vegetables can become contaminated if they are harvested from a field with sewage in it. Flies can breed in infected feces and then contaminate food. *Shigella* infections can also be acquired by drinking or swimming in contaminated water. Water may become contaminated with *Shigella* bacteria if sewage runs into it or if someone with shigellosis swims in or plays with it (especially in splash tables, untreated wading pools or shallow play fountains used by daycare centers). *Shigella* infections can then be acquired by drinking, swimming in or playing with the contaminated water. Outbreaks of shigellosis have also occurred among men who have sex with men.

### **What can a person do to prevent this illness?**

Currently, there is no vaccine to prevent shigellosis. However, the spread of *Shigella* from an infected person to other persons can be stopped by frequent and careful hand washing with soap. Frequent and careful hand washing is important among all age groups. Hand washing among children should be frequent and supervised by an adult in daycare centers and homes with children who have not been fully toilet trained.

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, Lysol or bactericidal wipes. When possible, young children with a *Shigella* infection who are still in diapers should not be in contact with uninfected children.

Basic food safety precautions and disinfection of drinking water prevents shigellosis from food and water. However, people with shigellosis should not prepare food or drinks for others until they have been shown to no longer be carrying the *Shigella* bacterium, or if they have had no diarrhea for at least 2 days. At swimming beaches, having enough bathrooms and hand washing stations with soap near the

swimming area helps keep the water from becoming contaminated. Daycare centers should not provide water play areas.

Simple precautions taken while traveling to the developing world can prevent shigellosis. Drink only treated or boiled water, and eat only cooked hot foods or fruits you peel yourself. The same precautions prevent other types of traveler's diarrhea.

### **How common is shigellosis?**

Every year, about 14,000 laboratory-confirmed cases of shigellosis are reported in the United States. Because many milder cases are not diagnosed or reported, the actual number of infections may be 20 times greater. Shigellosis is particularly common and causes recurrent problems in settings where hygiene is poor and can sometimes sweep through entire communities. Shigellosis is more common in summer than winter. Children, especially toddlers 2-4 years of age, are the most likely to get shigellosis. Many cases are related to the spread of illness in child care settings, and many more are the result of the spread of the illness in families with small children. In the developing world, shigellosis is far more common and is present in most communities most of the time.

### **What else can be done to prevent shigellosis?**

It is important for the public health department to know about cases of shigellosis. If many cases occur at the same time, it may mean that a restaurant, food or water supply has a problem, which needs correction by the public health department. If a number of cases occur in a child care center, the public health department may need to coordinate efforts to improve hand washing among the staff, children and their families. When a community-wide outbreak occurs, a community-wide approach to promote hand washing and basic hygiene among children can stop the outbreak. Improvements in hygiene for vegetables and fruit picking and packing may prevent shigellosis caused by contaminated produce.

Some prevention steps occur daily, without you thinking about it. Making municipal water supplies safe and treating sewage are highly effective prevention measures that have been in place for many years.

### **Some tips for preventing the spread of shigellosis:**

- Wash hands with soap carefully and frequently, especially after going to the bathroom, after changing diapers and before preparing foods or beverages.
- Dispose of soiled diapers properly.
- Disinfect diaper changing areas after using them.
- Keep children with diarrhea out of child care settings.
- Supervise hand washing of toddlers and small children after they use the toilet.
- Do not prepare food for others while ill with diarrhea.
- Avoid swallowing water from ponds, lakes, or untreated pools.
- If you are traveling to the developing world, "boil it, cook it, peel it or forget it."