

Shigellosis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Shigellosis refers to disease caused by any bacteria in the genus *Shigella*. There are four *Shigella* species (or serogroups): *S. dysenteriae* (A), *S. flexneri* (B), *S. boydii* (C), and *S. sonnei* (D).

B. Clinical Description

The most common symptoms of shigellosis are diarrhea (sometimes bloody), fever, nausea, vomiting and stomach cramps. Dehydration may be severe, especially among infants and the elderly. Asymptomatic infections also occur. The disease is usually self-limiting, lasting 4–7 days. *S. dysenteriae* is usually associated with more severe disease and complications.

C. Reservoirs

Humans are the only significant reservoir.

D. Modes of Transmission

Shigella bacteria are transmitted via the fecal-oral route. A very small dose of *Shigella* is needed to cause illness (probably 10–100 organisms). The most common mode of transmission is person-to-person spread of the bacteria from a case or carrier, which typically occurs among household contacts, preschool children in childcare, and the elderly and developmentally disabled living in residential facilities. Individuals shedding the bacteria may also contaminate food by failing to properly wash their hands before foodhandling activities, potentially causing large numbers of people to become ill. Transmission can also occur person-to-person through certain types of sexual contact (e.g., oral-anal contact). Flies can potentially spread the bacteria by landing on contaminated feces and then on food.

E. Incubation Period

The incubation period can vary from 12 to 96 hours, but is usually about 1–3 days. It can be up to a week for *S. dysenteriae*.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *Shigella* in their stool. This usually lasts for less than 4 weeks after onset of illness. While persons are most infectious while they have diarrhea, the disease can be transmitted by persons who have no symptoms. Effective antibiotic treatment has been shown to decrease the shedding period to a few days.

G. Epidemiology

Approximately 250 cases are reported in Colorado annually. *S. sonnei* is the most common *Shigella* species reported in Colorado. Outbreaks in the US have occurred in child care centers, among men who have sex with men, and in correctional facilities. In the summer of 2003, there were nine identified outbreaks at child care centers in the Denver metro area. Outbreaks have also been caused by contaminated food, such as raw produce.

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 2

SUBJECT: Shigellosis

Colorado Statistics are available at the CDPHE website:

www.cdphe.state.co.us/dc/CODiseaseStatistics/

2) CASE DEFINITION

Clinical Description

An illness of variable severity commonly characterized by diarrhea, fever, nausea, cramps, and tenesmus (constant feeling of needing to have a bowel movement). Asymptomatic infections may occur.

Laboratory Criteria for Diagnosis

Isolation of *Shigella* from a clinical specimen.

Note: In an outbreak or in a food service, child care, or institutional setting where antibiotic treatment may be indicated, obtain the antibiotic susceptibilities of the organism from the clinical laboratory.

Case Classification

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

Confirmed: a case that is laboratory confirmed. Confirmed cases include asymptomatic infections and infections at sites other than the gastrointestinal tract that are laboratory confirmed (rare).

3) REPORTING CRITERIA

What to Report to the Colorado Department of Public Health and Environment (CDPHE) or local health agency

- Confirmed and probable shigellosis cases.
- Shigellosis cases should be reported within 7 days of diagnosis or a positive laboratory test.
- Cases should be reported using the Colorado Electronic Disease Reporting System (CEDRS), or fax or telephone to CDPHE or local health departments. See below for phone and fax numbers.
- Suspected foodborne/enteric disease outbreaks should be reported to CDPHE or local health departments within 24 hours, even if the causative agent is not yet known.

Purpose of Surveillance and Reporting

- To identify cases for investigation and potential outbreaks
- To monitor trends in disease incidence

Important Telephone Numbers and Web Resources

- CDPHE Communicable Disease Epidemiology Program
 - Phone: 303-692-2700 or 800-866-2759
 - Fax: 303-782-0338
 - After hours: 303-370-9395
- CDPHE Microbiology Laboratory: 303-692-3480
- Communicable Disease (CD) Manual website:
http://www.cdphe.state.co.us/dc/epidemiology/dc_manual.html

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 3

SUBJECT: Shigellosis

4) STATE LABORATORY SERVICES

Laboratory Testing Services Available

*The services listed below are for public health purposes; clinical laboratories are **not** charged for these services.*

- The CDPHE Laboratory requests all *Shigella* isolates from clinical laboratories be submitted for serogrouping.
- The CDPHE Laboratory will test bulk stool or rectal swab specimens for the presence of *Shigella* and will serogroup *Shigella* isolates.
- Pulsed Field Gel Electrophoresis (PFGE) testing (i.e., molecular typing) is performed on all *Shigella sonnei* isolates, and on isolates of other serogroups when clusters are identified.
- For more information on *Shigella* testing, contact the CDPHE Microbiology Laboratory.
- **Note:** Authorization by the CDPHE Communicable Disease Program is required before submitting bulk stool, rectal swabs, or implicated food items to the CDPHE Laboratory.
- See Section 6 (E)--Environmental Measures, for more information about food testing.

5) CASE INVESTIGATION

Interview all shigellosis cases including symptomatic contacts of confirmed cases and others whose symptoms are suspected to be caused by *Shigella* to determine:

- Potential source of infection, and to implement control measures as appropriate
- If others are ill (i.e. Could this be an outbreak?)
- If the case may be a source of infection for others (e.g. a high-risk worker or a diapered child), and if so, to prevent further transmission

Organized local health departments have primary responsibility for interviews of sporadic cases in their jurisdictions. In other jurisdictions, public health nursing services should consult with regional epidemiologists to establish primary responsibility for interviews of sporadic cases.

For single cases, complete the CDPHE [Shigellosis Case Investigation Form](#) or a similar local health agency form. Following patient interviews, complete the CEDRS record for all confirmed and probable cases. If an outbreak is suspected, outbreak-specific interview forms should be used. Please contact CDPHE for assistance.

A. Case Investigation / Forms

Complete all sections of the CDPHE [Shigellosis Case Investigation Form](#) can be found on the CD manual website. Local health departments are encouraged to use the standard CDPHE investigation form.

For agencies that choose to use their own case investigation forms, the following information should be collected:

- *Demographics (including address, date of birth, ethnicity and race)*
- *Occupation (**High risk occupations include: food service, child care, and health care**)*
- *Child care or School Attendance*
- *Symptoms and Onset Date*

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 4

SUBJECT: Shigellosis

- *Laboratory (date of specimen collection)*
- *Hospitalization and Medical Treatment Received*
- *Food History (during the 3 days prior to onset)*
- *Restaurant History (include food items and date consumed)*
- *Travel History (locations and dates)*
- *Drinking Water Source*
- *Recent Group Activities*
- *Contacts with Persons with Gastrointestinal Illness*

B. Identify and Evaluate Contacts

1. Symptomatic Contacts

- Contacts of a confirmed case, who have diarrhea, are probable cases and are treated the same as confirmed cases for disease control purposes. See Section 6--Disease Control Measures.
- Complete a case investigation form on all epidemiologically-linked individuals having symptoms compatible with shigellosis.
- Refer symptomatic individuals who have not previously been tested (especially if they are high-risk workers) to their health care providers for stool cultures. If testing will be performed by CDPHE, refer to the [Food and Stool Specimen Collection Instructions](#) on the CD manual website.
- CDPHE recommends that people who are experiencing symptoms submit stool specimens through their health care provider rather than to the state laboratory for several reasons:
 - The patient will receive appropriate medical care for the illness, including antimicrobial therapy, if appropriate.
 - Results will be known more quickly if stool is tested by a commercial laboratory than if tested at the state laboratory.
 - Commercial labs generally perform antimicrobial susceptibility testing, whereas, the state lab does not routinely perform such testing.
- Symptomatic contacts without laboratory confirmation should be entered into CEDRS as probable shigellosis cases. (It is helpful if you enter the CEDRS ID numbers of the lab-confirmed cases to whom probable cases are epi-linked in the CEDRS case notes.)
- If a common source of infection is suspected, please notify CDPHE.

2. Asymptomatic Contacts

- Ask about sensitive occupations, food handling, child care, and/or school.
- Provide information about symptoms and preventive measures. See Section 6 (C)--Education.
- Counsel asymptomatic high-risk workers (e.g., food handlers). Stress importance of good handwashing, personal hygiene, and that they should not work and should notify their supervisor whenever they have a diarrheal illness.
- If an asymptomatic contact is a high-risk worker, consider obtaining stool specimens for testing and asking the contact to wear gloves until culture results are known, especially if there is any question about the worker's or the facility's hygienic practices.
- If an asymptomatic contact who is a high-risk worker develops diarrhea, exclude him/her from work, obtain a stool sample, and notify the worker's supervisor.

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 5

SUBJECT: Shigellosis

- Consult with Environmental Health staff and issue a glove order if necessary.

C. Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of shigellosis in your jurisdiction is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. Consult with a CDPHE Communicable Disease Epidemiologist. CDPHE staff can assist local public health agencies to investigate outbreaks and determine a course of action to prevent further cases, and can coordinate surveillance of cases that cross county lines.

6) DISEASE CONTROL MEASURES

A [Shigellosis Fact Sheet](#) is available on the CD manual website.

A. Treatment

Most infections with *Shigella* are self-limited and do not require antimicrobial therapy. However, antimicrobial therapy is effective in shortening the duration of diarrhea and eradicating organisms from feces. Treatment is recommended for patients with severe disease, dysentery, or underlying immunosuppressive conditions. In mild disease, the primary indication for treatment is to prevent spread of the organism. Because antimicrobial resistance is common in *Shigella*, when treatment is indicated, it is important to obtain the antimicrobial susceptibility pattern of the isolate from the clinical microbiology laboratory.

B. Prophylaxis

No prophylactic treatment of close contacts is recommended.

C. Education

- Educate case and household contacts on proper hand washing techniques.
- Always wash hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- After changing diapers, wash your hands AND the child's hands.
- In a child care setting, dispose of stool and soiled diapers in a sanitary manner.
- Cases should not prepare food for other individuals until symptoms resolve.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of shigellosis to sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.
- Keep flies from contaminating food.

D. Managing Special Situations

1. Food Handlers

- When a case of shigellosis occurs in a food handler, **immediate involvement of public health authorities is critical.**
- **Food handlers should be excluded from work until diarrhea has resolved and the patient has had two negative stool specimens taken at least 24 hours apart.**
- If a patient has been treated with an antibiotic, the stool specimen should not be collected until at least 48 hours after cessation of therapy.
- If the health department is confident that conscientious hand washing measures will be taken by an infected food handler, and there is participation and cooperation from the

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 6

SUBJECT: Shigellosis

facility manager, a food handler may perform other non-foodhandling tasks (i.e. cashier, cleaning) at the facility while awaiting results of repeat stool tests.

- A letter or memo should be sent to the food service facility documenting the requirements for the infected food handler.

2. Childcare/Preschool

When a case of shigellosis occurs in a childcare center attendee or worker, **immediate involvement of public health authorities is critical**. *Shigella* spreads very quickly through child care centers, but can be controlled if appropriate action is taken.

- Refer childcare providers to the CDPHE **Infectious Disease in Child Care Settings: Guidelines for Child Care Providers** (www.cdphe.state.co.us/dc/epidemiology/dc_guide.html) for an overview of shigellosis.
- For details on disease control and investigation in child care centers, local health departments should refer to the CDPHE guidelines **Shigellosis Outbreak Investigation and Control in Child Care Centers/Preschools** that can be found at: www.cdphe.state.co.us/dc/epidemiology/dc_guide.html
- **For a single case of shigellosis:** Children with shigellosis should not be permitted to re-enter the childcare center until diarrhea has resolved **and** *either* the child has been treated with an effective antibiotic for 3 days *or* there are 2 consecutive negative stool cultures.
- It is important to obtain the antibiotic susceptibility pattern for the isolate from the physician or the clinical laboratory that performed the test in order to determine if a child has been treated with an effective antibiotic.
- Parents of cases should be counseled not to take their children to another childcare center during this period of exclusion.
- Public health or environmental health staff should visit the facility, review hygienic procedures, and reinforce the importance of meticulous handwashing with childcare center staff.
- Look for symptoms consistent with *Shigella* infection (diarrhea and fever) in other children or staff during the 3 weeks previous to the report of the index case.
- If the index case is the only child in the classroom or facility who has been ill, that child may return as outlined above and no further action is indicated for other children in that classroom or facility.
- If others in the facility are identified with *Shigella*-like symptoms, refer to **Shigellosis Outbreak Investigation and Control in Child Care Centers/Preschools**. Child care center staff with *Shigella* infection can return to work after diarrhea has resolved, but they must not prepare food or feed children until they have two negative stool cultures collected at least 24 hours apart (and submitted at least 48 hours after cessation of antibiotics, if antibiotics are given). In this situation, it is important for Environmental Health staff to work closely with the center to ensure that affected staff do not handle food until cleared by public health. See Section 6 (D1)--Food Handlers above.

3. School

Refer school personnel to the CDPHE **Infectious Disease in School Settings - Guidelines for Nurses and School Personnel** (www.cdphe.state.co.us/dc/epidemiology/dc_guide.html) for additional shigellosis information.

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 7

SUBJECT: Shigellosis

- Students or staff with *Shigella* infection should be excluded until their diarrhea has resolved.
- If there are concerns about the case's hygiene (e.g. the case has developmental disabilities or behavioral problems) consider obtaining two negative stool cultures at least 24 hours apart before a case returns to class.
- Students or staff who handle food and have a *Shigella* infection must not prepare food until their diarrhea has resolved and they have two negative stool cultures obtained at least 24 hours apart. See Section 6 (D1)--Food Handlers.
- If case being re-tested has received antibiotics, stool should be collected at least 48 hours after antibiotics are completed.

4. Community Residential Programs (facilities serving the developmentally disabled)

Actions taken in response to a case of shigellosis in a community residential program will depend on the type of program and the level of functioning of the residents. In general:

- Residents with shigellosis should be placed on contact precautions until their symptoms subside and until two negative stool cultures have been obtained at least 24 hours apart.
- If case being re-tested has received antibiotics, stool should be collected at least 48 hours after antibiotics are completed.
- Residents with shigellosis must be excluded from handling or preparing food for other residents until their diarrhea has resolved and they have two cultures negative for *Shigella*.
- Staff members who provide direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions. See section 6 (D1)--Food Handlers.
- Staff members with *Shigella* infection who are not food handlers and do not provide direct patient care should be excluded from work until their diarrhea has resolved.

5. Patients in Health Care Facilities (Hospitals and Long Term Care Facilities)

Hospitals and long term care facilities generally have written infection control policies and procedures for handling cases of communicable disease among patients and staff members. If a facility does not have such policies in place, the following are provided as suggestions:

- Patients with shigellosis should be placed on contact precautions until their symptoms subside and two negative stool cultures have been obtained at least 24 hours apart.
- Health care workers are generally required to have two negative stool cultures taken 24 hours apart before returning to work.
- If case being re-tested has received antibiotics, stool should be collected at least 48 hours after antibiotics are completed.

E. Environmental Measures

- Implicated food items must be removed from the environment.
- A decision about testing suspect/implicated food items must be made in consultation with CDPHE Communicable Disease Program.
- If a commercial product is suspected, the CDPHE Communicable Disease Program will coordinate follow-up with the CDPHE Consumer Protection Division and relevant outside agencies.
- The CDPHE [Food and Stool Specimen Collection Instructions](#) can be found on the CD manual website.

Colorado Communicable Disease Manual

ISSUED: 12/13/2004

REVISED: 05/26/2005

PAGE: 8

SUBJECT: Shigellosis

- The general policy of the CDPHE Laboratory and the Communicable Disease Program is only to test food samples associated with outbreaks, not in single cases.
- For single cases, CDPHE may suggest that the holders of food locate a private laboratory that will test food, or that they store the food in their freezer for a period of time in case additional reports are received.
- The CDPHE laboratory can test food samples associated with isolated cases of illness on a fee for service basis. For more information, contact the CDPHE Microbiology Laboratory.

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