CYCLOSPORA

Also known as: Cyanobacterium-like, coccidia-like, and *Cyclospora*-like bodies (CLBs)
***Cyclospora* infection = cyclosporiasis**

Responsibilities:
Hospital: Report by IDSS, facsimile, mail or phone
Lab: Report by IDSS, facsimile, mail or phone
Physician: Report by facsimile, mail or phone
Local Public Health Agency (LPHA): Follow-up required.

Iowa Department of Public Health
Disease Reporting Hotline: (800) 362-2736
Secure Fax (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

This disease is caused by *Cyclospora cayetanensis*, a single cell microscopic protozoan parasite. Humans with cyclosporiasis shed the parasite in a non-infectious form that takes from several days to a couple of weeks to mature into its infectious form. The time required for maturation to the infectious form depends on factors such as temperature and moisture.

B. Clinical Description

This parasite infects the small intestine (bowel) and typically causes watery diarrhea, which can be severe. Other symptoms can include nausea, vomiting, abdominal cramping, gas and bloating, fatigue and loss of appetite, anorexia, weight loss, abdominal pain, myalgias, and low-grade fever. Occasionally, infected individuals may not have any symptoms. Untreated, symptoms may last from several days to several weeks (longer in immunocompromised individuals), and weight loss can be significant (exceeding 20 pounds in some cases).

C. Reservoirs

Humans are the only known reservoir for *Cyclospora cayetanen*sis, however animal reservoirs have been suspected. *Cyclospora* has been found on a variety of fruits and vegetables including lettuce and raspberries.

D. Modes of Transmission

Current knowledge of human cyclosporiasis suggests that it is not likely to be transmitted directly from person-to-person. After being shed in human stool, the parasite must undergo developmental changes (taking days to weeks) before becoming infectious. Humans become infected by consuming food or water that has been contaminated with human feces containing *Cyclospora*.

E. Incubation Period

The incubation period is about 1 - 2 weeks, with an average of 1 week.

F. Period of Communicability or Infectious Period

People may shed *Cyclospora* parasites for days to over one month (while actively ill). It is not known how long the parasite may be shed after symptoms have stopped.

G. Epidemiology

Cyclosporiasis was first recognized in 1979. The parasite appears to be widely distributed throughout the world with a predominant number of cases occurring during the warmer months. *Cyclospora* may be transmitted by ingestion of water or food contaminated with oocysts. Outbreaks linked to contaminated water and fresh produce have been reported in recent years. Large outbreaks of cyclosporiasis in the United States occurred during the summers of 1996 and 1997; a majority of those cases had consumed imported raspberries. Iowa experienced an outbreak of 148 cases in 2013 linked to imported salad greens.

To date, the fresh produce items that have been implicated in U.S. outbreaks include fresh imported raspberries, basil, snow peas, and varieties of lettuce. Persons of all ages are at risk for infection. Persons living or traveling in developing countries may be at increased risk.

H. Bioterrorism Potential

None.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify transmission sources of public health concern (e.g., contaminated food or water) and to stop transmission from such sources.
- To provide education about how to reduce the risk of infection.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred method of reporting is by utilizing the Iowa Disease Surveillance System (IDSS). However, if IDSS is not available to your facility the reporting number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698, mailing address:

IDPH, CADE
Lucas State Office Building, 5th Floor
321 E. 12th Street
Des Moines, IA 50319-0075

Postage-paid disease reporting forms are available free of charge from the IDPH clearinghouse. Call (319) 398-5133 or visit the website healthclrhouse.drugfreeinfo.org/cart.php?target=category&category_id=295 to request a supply.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) provides ova and parasite testing of stool specimens for *Cyclospora*. Submit specimens in 10% formalin. Specimen collection kits are available from the SHL. Contact the SHL at (319) 335-4500 for further instructions.

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. Individual cases: Local public health agencies will conduct followup

b. Multiple cases/possible outbreak
If the number of reported cases of cyclosporiasis in a city/town is higher than usual, or if an outbreak is suspected, an investigation is warranted to determine the source of infection and mode of transmission. A common vehicle, such as water or food, should be sought and applicable preventive or control measures should be instituted (*e.g.,* removing an implicated food item from

the environment). Consult with an epidemiologist at IDPH or contact your regional epidemiologist if an outbreak is suspected**.** CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several town lines and therefore be difficult to identify at a local level.

c. If a food or water source is suspect follow-up may include involvement of a representative of the Iowa Department of Inspections and Appeals, Food and Consumer Safety Bureau who are involved in enforcement of the Iowa Food Code.

d. Institution of disease control measures is an integral part of case investigation. It is the LPHA responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 3), Controlling Further Spread.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Cyclosporiasis (*Cyclospora* infection) is not identified as a quarantinable disease under Iowa Administrative Code. The following guidelines are recommended.

Minimum Period of Isolation of Patient

Food handlers with confirmed *Cyclospora* infection should be excluded from work. After diarrhea has resolved, food handlers may only return to work after instruction on proper handwashing technique.

Minimum Period of Isolation of Contacts

Contacts with diarrhea who are food handlers shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A food handler is any person directly handling or preparing food.

B. Protection of Contacts of a Case

None.

Preventive Measures

Personal Preventive Measures/Education

To avoid infection with *Cyclospora*, recommend that individuals:

- Avoid drinking un-boiled or untreated water when hiking, traveling in developing countries or wherever the water quality is unknown. Bringing water to a full, rolling boil is sufficient to kill *Cyclospora*.
- Thoroughly wash all fresh fruits and vegetables prior to consumption, but this may not eliminate the risk entirely.

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Cyclospora can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

References

American Academy of Pediatrics. *2003 Red Book: Report of the Committee on Infectious Diseases, 26th Edition.* Illinois, Academy of Pediatrics, 2003.

CDC Website. *Cyclospora* Infection. www.cdc.gov/parasites/cyclosporiasis/epi.html

Heymann, D., ed., *Control of Communicable Diseases Manual, 20th* Edition. Washington, DC, American Public Health Association, 2015.

Soave, Rosemary. *Cyclospora*: An Overview. *Clinical Infectious Diseases,* 1996; 23:429-37.