Cyclosporiasis

Cyclospora Cayetanensis

DISEASE REPORTABLE WITHIN 24 HOURS OF DIAGNOSIS

Per N.J.A.C. 8:57, healthcare providers and administrators shall report by mail or by electronic reporting within 24 hours of diagnosis, confirmed cases of cyclosporiasis to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made. A directory of local health departments in New Jersey is available at http://www.state.nj.us/health/lh/directory/lhdselectcounty.shtml.

If the health officer is unavailable, the healthcare provider or administrator shall make the report to the Department by telephone to 609.826.5964, between 8:00 A.M. and 5:00 P.M. on non-holiday weekdays or to 609.392.2020 during all other days and hours.

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1 THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

This disease is caused by *Cyclospora cayetanensis,* a coccidian protozoan parasite. Humans with cyclosporiasis shed the parasite in a noninfectious 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. In vitro sporulation at 27°C to 32°C takes from eight to 11 days.

B. Clinical Description and Laboratory Diagnosis

This parasite infects the small intestine and typically causes watery diarrhea. Other symptoms can include nausea, vomiting, abdominal cramping, gas and bloating, fatigue, and loss of appetite and weight. Occasionally, infected individuals in disease-endemic areas 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). Infection is usually self-limited and relapse of symptoms is common in untreated persons.

Laboratory diagnosis is based on microscopic identification of oocysts in stool, duodenal aspirates, or small bowel biopsy specimens. Molecular diagnostic methods based on polymerase chain reaction (PCR) are used by some laboratories and may cross-react with *Eimeria* species.

C. Reservoirs

Humans are the only known reservoir for *C. cayetanensis*.

D. Modes of Transmission

Direct human-to-human transmission has not been documented, probably because excreted oocysts take days to weeks under certain environmental conditions to sporulate and become infectious. Humans become infected by consuming food or water that has been contaminated

with human feces containing *Cyclospora*. Outbreaks in the United States have been associated with imported raspberries and with other fresh produce. Agricultural water used for spraying may contaminate berries, and their delicate surfaces make cleaning difficult.

E. Incubation Period

The average incubation period is one week, with a range of one to 14 days.

F. Period of Communicability or Infectious Period

People may shed *Cyclospora* parasites for days to more than 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 is found throughout the world and is endemic in countries such as Nepal, Peru, and Haiti. Cyclosporiasis has frequently been reported as a cause of traveler's diarrhea. Most cases occur during the warmer months. The largest documented outbreaks of cyclosporiasis in the United States occurred during the summers of 1996 and 1997; most of those cases were associated with imported raspberries. During the years 2002 to 2005, an average of eight cases per year were reported to the New Jersey Department of Health and Senior Services (NJDHSS).

2 CASE DEFINITIION

A. NJDHSS Case Definition

1. Clinical Description

An illness of variable severity caused by the protozoan parasite Cyclospora cayetanensis. The most common symptom is watery diarrhea. Other common symptoms include loss of appetite, weight loss, abdominal cramps/bloating, nausea, body aches , and fatigue. Vomiting and lowgrade fever also may be noted.

2. Laboratory Criteria for Diagnosis

Laboratory-confirmed cyclosporiasis shall be defined as the detection of *Cyclospora* organisms or DNA in stool, intestinal fluid/aspirate, or intestinal biopsy specimens.

3. Case Classification

CONFIRMED
A case that meets the clinical description and at least one of the criteria for laboratory confirmation as described above.

PROBABLE
A case that meets the clinical description and that is epidemiologically linked to a confirmed case.

POSSIBLE
Not used.

B. Differences from Centers for Disease Control and Prevention (CDC) Case Definition

The NJDHSS and CDC 2010 case definitions are the same.

3 LABORATORY TESTING AVAILABLE

The Public Health and Environmental Laboratories provide testing for *C. cayetanensis* on formalinized fecal material using acid-fast staining techniques to identify the presence of oocysts. Analysis will be performed only in an outbreak situation with prior approval from staff of the Infectious and Zoonotic Disease Program (IZDP). Additional information regarding this testing may be obtained by calling the Enteric Laboratory at 609.292.7368.

4 PURPOSE OF SURVEILLANCE AND REPORTING AND REPORTING REQUIREMENTS

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 reducing risk of infection

B. Laboratory Reporting Requirements

The New Jersey Administrative Code (NJAC 8:57-1.8) stipulates that laboratories report (by telephone, by confidential fax, over the Internet using the Communicable Disease Reporting and Surveillance System [CDRSS], or in writing) all cases of cyclosporiasis to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain, at a minimum, the reporting laboratory's name, address, and telephone number; the age, date of birth, gender, race, ethnicity, home address, and telephone number of the person tested; the test performed; the date of testing; the test results; and the healthcare provider's name and address.

C. Healthcare Provider Reporting Requirements

The New Jersey Administrative Code (NJAC 8:57-1.4) stipulates that healthcare providers report (by telephone, by confidential fax, or in writing) all cases of cyclosporiasis to the local health officer having jurisdiction over the locality in which the patient lives or, if unknown, to the health officer in whose jurisdiction the healthcare provider requesting the laboratory examination is located. The report shall contain the name of the disease; date of illness onset; and name, age, date of birth, race, ethnicity, home address, and telephone number of the patient. Additionally, the name, address, institution, and telephone number of the reporting official and other information as may be required by NJDHSS concerning a specific disease should be reported.

D. Local Health Departments' Reporting and Follow-Up Responsibilities Reporting Requirements

The New Jersey Administrative Code (NJAC 8:57-1.7) stipulates that each local health officer must report the occurrence of any case of cyclosporiasis within 24 hours of receiving a report from a laboratory or healthcare provider to the NJDHSS IZDP. A report can be mailed or filed electronically over the Internet using the confidential and secure CDRSS.

5 CASE INVESTIGATION

A. Forms

- It is the local health officer's responsibility to investigate the case and complete the "Cyclosporiasis Surveillance Case Report Form" by interviewing the patient and others who may be able to provide pertinent information. Clinical information can be obtained from the patient's healthcare provider or medical record.
- When asking about exposure history (food, travel, activities, and so forth), use the incubation period for cyclosporiasis (one to 14 days). Specifically, focus on the period beginning a minimum of one day before the patient's onset date back to no more than 14 days before onset.
- In a case of an outbreak, immediately notify the NJDHSS IZDP by telephone at 609.826.5964 during business hours and 609.392.2020 after business hours and on weekends and holidays.
- If there have been several unsuccessful attempts to obtain patient information, please fill out the report with as much information as possible. Please note on the report why it could not be completed as well as name and affiliation of the person submitting the report and the person reporting the illness.
- After completing the investigation, mail the Cyclosporiasis Surveillance Case Report Form (in an envelope marked "Confidential") to IZDP, or file the report electronically over the Internet using the confidential and secure CDRSS.

The mailing address is:

NJDHSS
Communicable Disease Service
Infectious and Zoonotic Diseases Program
PO Box 369
Trenton, NJ 08625-0369

B. Entry into CDRSS:

The mandatory fields for all cases in CDRSS include: disease, last name, county, municipality, gender, race, ethnicity, case status, report status.

The following table can be used as a quick reference guide to determine which fields in CDRSS are necessary for accurate and complete reporting of cyclosporiasis cases. The first column represents the tabs along the top of the CDRSS screen. The Required Fields column reflects a detailed explanation of the essential data for each tab.

CDRSS Screen	Required Information
Patient Info	Enter disease name ("CYCLOSPORIASIS"), patient demographics, patient onset and date report was made to the local health department. There are no subgroups for cyclosporiasis.
Addresses	Use as needed for additional addresses (e.g., work address, school, temporary NJ address for out-of-state case). Use the Comments section in this screen to record any pertinent information about the alternate address (e.g., the times per week the case-patient attends daycare).Entering an alternate address will allow other disease investigators access to the case if the alternate address falls within their jurisdiction.
Clinical Status	Clinical information such as past medical history, any treatment that the patient received, name of medical facility(s) including date of initial healthcare evaluation and dates of hospitalization, treating physician(s), and mortality status are entered here. (**NOTE:** If the patient received care from two or more medical facilities, be sure all are recorded in the case including admit/discharge dates so the case can be accessed by all infection control professionals (ICPs) covering these facilities.)
Signs/Symptoms	Make every effort to get complete information by interviewing the physician, family members, ICP, or others who might have knowledge of the patient's illness. Check appropriate boxes for signs and symptoms and indicate their onset and resolution.

CDRSS Screen	Required Information
Risk Factors	Enter complete information about risk factors including complete food history, (if possible, record any restaurants or social gatherings at which the patient ate including food item(s) and date consumed), travel history, particularly travel out of the country, any gatherings or outdoor activities attended including recreational swimming, boating, and water park visits, questions about water supply (cyclosporiasis may be acquired through water consumption), pet or other animal contact and record in the Comments section. When asking about exposure history (food, travel, activities, and so forth), use the incubation period for cyclosporiasis (one to 14 days). Specifically, focus on the period beginning a minimum of one day before the patient's onset date back to no more than 14 days before onset.
Laboratory Eval	Laboratory test name "MICROSCOPIC OBSERVATION," "OVA AND PARASITES EXAM," or "CYCLOSPORA IDENTIFIED BY ACID FAST STAIN," Lab Specimen ID, Specimen, Date specimen collected, Lab Name, Referring Physician Name, Referring Medical Facility name, Test Result i.e., Positive/reactive or Negative/no reactive.
Contact Tracing	All potentially exposed contacts are entered into the contact tracing tab for local, county and statewide surveillance efforts. CDRSS requires a "YES" response to one of the two cyclosporiasis exposure questions in order to add case contacts. Contacts are added individually by selecting the Enter Contact By Name feature: Each contact record reflects the period of exposure, symptomatic or asymptomatic, contact demographics, telephone numbers, marital status, primary language, exposure risk i.e., close, casual, unknown, and LHD response activities are noted. An exposure setting is selected for each contact from the drop down to the right of the contact's name. A summary reflecting the following contact details: total number, name, age, relationship, exposure specifics as well as all LHD recommendations to prevent further transmission of illness are entered into the contact tracing text box.
Case Comments	Any additional case investigation findings that can not be entered in discrete data fields are documented in the general comment section.

CDRSS Screen	Required Information
Epidemiology	Select the route of transmission route, import status of infection i.e., whether the case was imported and from where (another county, state, country), LHD notification of illness and association with high-risk venue type, name, location and last day of attendance. The NJDHSS assigned outbreak or investigation number is selected for all involved cases which automatically populates a summary of the initial report.
Case Classification Report Status	Case status options are: "REPORT UNDER INVESTIGATION (RUI)," "CONFIRMED," "PROBABLE," "POSSIBLE," and "NOT A CASE." • All cases entered by laboratories (including LabCorp electronic submissions) should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Cases still under investigation by the LHD should be assigned a case status of "REPORT UNDER INVESTIGATION (RUI)." • Upon completion of the investigation, the LHD should assign a case status on the basis of the case definition. "CONFIRMED," "PROBABLE," and "NOT A CASE" are the only appropriate options for classifying a case of cyclosporiasis. Report status options are: "PENDING," "LHD OPEN," "LHD REVIEW," "LHD CLOSED," "DELETE," "REOPENED," "DHSS OPEN," "DHSS REVIEW," and "DHSS APPROVED." • Cases reported by laboratories (including LabCorp electronic submissions) should be assigned a report status of "PENDING." • Once the LHD begins investigating a case, the report status should be changed to "LHD OPEN." • The "LHD REVIEW" option can be used if the LHD has a person who reviews the case before it is closed (e.g., health officer or director of nursing). • Once the LHD investigation is complete and all the data are entered into CDRSS, the LHD should change the report status to "LHD CLOSED." • "LHD CLOSED" cases will be reviewed by DHSS and be assigned one of the DHSS-specific report status categories. If additional information is needed on a particular case, the report status will be changed to "REOPENED" and the LHD

CDRSS Screen	Required Information
	will be notified by e-mail. Cases that are "DHSS APPROVED" cannot be edited by LHD staff. If a case is inappropriately entered as a case of cyclosporiasis the case should be assigned a report status of "DELETE." A report status of "DELETE" should NOT be used if a reported case of cyclosporiasis simply does not meet case definition. Rather, it should be assigned the appropriate case status, as described above.

C. Other Reporting/Investigation Issues

- Case report forms (GI Illness Worksheet and/or labs) DO NOT need to be mailed to NJDHSS as long as mandatory fields in CDRSS indicated in section B are completed.
- Once LHD completes its investigation and assigns a report status of "LHD CLOSED," NJDHSS will review the case. NJDHSS will approve the case by changing the report status to "DHSS APPROVED." At this time, the case will be submitted to CDC and the case will be locked for editing. If additional information is received after a case has been placed in "DHSS APPROVED," you will need to contact NJDHSS to reopen the case. This should be done only if the additional information changes the case status of the report.
- Every effort should be made to complete the investigation within three months of opening a case. Cases that remain open for three months or more and have no investigation or update notes will be closed by NJDHSS.

6 CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (NJAC 8:57-1.12)

1. Minimum Period of Isolation of Patient

No restrictions.

2. Minimum Period of Isolation of Contacts

No restrictions.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

1. Daycare Centers and Schools

As noted in Section 1D of this chapter, current knowledge of human cyclosporiasis suggests that it is NOT 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*. There are no specific recommendations for daycare or school situations as found in the other enteric disease chapters (e.g., salmonellosis, shigellosis, and so forth). See the next section if a cluster of cases identified at a school or daycare may be associated with a contaminated food item.

7 REPORTED INCIDENCE IS HIGHER THAN USUAL/OUTBREAK SUSPECTED

If the number of reported cases of cyclosporiasis in a city or town is higher than usual, or if an outbreak is suspected, investigate 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 the IZDP. IZDP staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

8 PREVENTIVE MEASURES

1. Personal Preventive Measures/Education

To avoid infection with Cyclospora, recommend that individuals

- Avoid drinking unboiled or untreated water when hiking, traveling in developing countries, or wherever the water quality is unknown. Bringing water to a full, rolling boil for one minute is sufficient to kill *Cyclospora*.
- Thoroughly wash all fresh fruits and vegetables before consumption. This precaution, however, may not entirely eliminate the risk of transmission.

Additional Information

Additional information can be obtained from the US Food and Drug Administration's Center for Food Safety and Applied Nutrition Web site at www.cfsan.fda.gov.

Additional information regarding international travel may be obtained from the CDC, Traveler's Health Office, at 877.394.8747 or through the Internet at http://www.cdc.gov/travel.

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