

Cyclospora

Investigation Guideline

CONTENT:

VERSION DATE:

Investigation Protocol:

- Investigation Guideline 01/2010

Supporting Materials found in attachments:

- Fact Sheet 04/2009

Revision History:

Date	Replaced	Comments
02/2012	-	Removed references to KS-EDSS.

Cyclospora

Disease Management and Investigative Guidelines

CASE DEFINITION (CDC 2010)

Clinical Description for Public Health Surveillance:

An illness of variable severity caused by the protozoan parasite *Cyclospora cayentanensis*. 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 low grade fever also may be noted.

Laboratory Criteria for Case Classification:

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

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.

LABORATORY ANALYSIS

- The Kansas Health and Environment Laboratory (KHEL) provide Parasite (O & P) Feces Mailers for parasite testing. If only cyclosporiasis testing is needed, concentration and molecular techniques are used.
 - Please, write “test for Cyclospora” in submitter comments.
- The specimen (feces) should be split into portions which are treated as follows:
 - Fixed in 10% formalin (for direct microscopy, concentration procedures, and preparation of stained smears); and
 - Frozen without fixation (for molecular diagnosis); or
 - Fresh specimens should be refrigerated and sent to the diagnostic laboratory as rapidly as possible. Do not refrigerate the preserved samples.

Note: Specimens fixed in sodium acetate-acetic acid formalin can be handled in the same manner as specimens fixed in formalin. Specimens fixed in polyvinyl alcohol (PVA) are of limited value because they are not usable for concentration procedures but can be used to identify other parasites.

- Molecular testing (on frozen specimens) is performed at CDC.
- Timing of specimens:
 - Because parasites may be passed intermittently, the collection of three specimens within a 10-day period is recommended.
 - Specimens should be collected at least 48 hours apart. .
- For additional information concerning collection or sample transport, call (785) 296-1620 or refer to guidance at www.kdheks.gov/labs/lab_ref_guide.htm

EPIDEMIOLOGY

Cyclospora is acquired by ingesting infectious oocysts found in contaminated drinking water and/or on fresh fruits or vegetables. After infection and reproduction in the small bowel within a human host, oocysts are produced and excreted in the stool. Excreted oocysts are not immediately infectious as they must sporulate outside the host. This may take weeks to months; therefore, direct human-to-human infection does not occur. Cyclosporiasis is common in many developing countries with an increase incidence noted during the spring and summer months. Outbreaks have been reported in the United States and have been associated with the ingestion of imported produce, including: raspberries, basil, and lettuce.

DISEASE OVERVIEW

A. Agent:

The protozoan parasite *Cyclospora cayetanensis*.

B. Clinical Description:

Symptoms typically include: diarrhea, abdominal cramps, nausea, fatigue, and anorexia. Vomiting and fever are uncommon. Without treatment, symptoms may last several days to weeks and typically last longer in immune-compromised individuals. Significant weight loss may occur.

C. Reservoirs:

Humans are the only known reservoir; however, animal reservoirs are suspected.

D. Mode(s) of Transmission:

Direct person-to-person transmission does not occur. Noninfectious unsporulated oocysts are passed in stools; these oocysts take days to weeks, under favorable environmental conditions, to sporulate and become infectious. (The time required for sporulation to occur, under laboratory conditions, is 14 days). Humans become infected by consuming food or water that has been contaminated with human feces containing *C. cayetanensis* that has then had time to sporulate in the environment into an infectious form.

E. Incubation Period:

Range 1-14 days; average 7 days.

F. Period of Communicability:

Case person(s) shed unsporulated oocysts while actively ill. It is not known how long oocysts may be shed after symptoms have stopped.

G. Susceptibility and Resistance:

Susceptibility is universal and reinfection may occur.

H. Treatment:

Trimethoprim-sulfamethoxazole is the pharmacologic therapy of choice.

INVESTIGATOR RESPONSIBILITIES

- 1) Use current [case definition](#), to confirm diagnosis with the medical provider.
- 2) Conduct a [case investigation](#) to identify potential source of infection.
- 3) Conduct [contact investigation](#) to identify additional cases.
- 4) Identify whether the source of infection is major public health concern.
- 5) Initiate control and prevention measures to prevent spread of disease.
- 6) Complete all information requested in the state electronic surveillance system.
- 7) As appropriate, use the disease [fact sheet](#) to notify individuals or groups.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Case Investigation

- 1) Contact the medical provider who ordered testing of the case and obtain the following information. (This includes medical records for hospitalized patients.)
 - Identify if the patient was ill with symptoms of cyclospora.
 - If yes, record onset date of illness
 - Record symptoms: fever, abdominal pain, headache, or other (specify).
 - Examine the laboratory testing that was reported. Only if needed, obtain copies of laboratory reports that are needed to confirm the case.
 - Examine patient's medical history: record any information about possible immunocompromised conditions and treatments.
 - Examine the treatment prescribed; i.e. antibiotic treatment, date started/ended, and any reason why sulfa drugs may not have been used.
 - Collect case's demographic data and contact information (birth date, county, sex, race/ethnicity, occupation, address, phone number(s))
 - Record hospitalizations: location, admission and discharge dates
 - Record outcomes: recovered or date of death
- 2) Interview the case or proxy to determine source and risk factors; focus on incubation period 2 weeks prior to illness onset.
 - Travel history:
 - Travel outside of KS; list states visited; dates visited
 - Travel outside of U.S.; list country; date of departure and return to U.S.
 - If the case had no travel outside of the United States, collect information on the case's food history a period of 2 weeks before illness onset. Include consumption of :
 - Untreated water. List date(s) of consumption and location.
 - Fresh fruits, vegetables or herbs. (type, source)
 - Collect information from case for the [Contact Investigation](#). (See below).
- 3) Investigate epi-links among cases (clusters, household, co-workers, etc).
 - Inquire about others in the household with similar symptoms.
 - Investigate highly suspected local sources; see [Environmental Measures](#).
 - For suspected [outbreaks](#) to Managing Special Situations section.

Contact Investigation

- 1) Contacts are defined as those with possible exposure to the source of infection. Contacts are not just persons in close proximity to a case.
- 2) Identify persons who participated with the case in any of the potential at-risk activities and contact them, as well as any acquaintance or household member with similar illness.
- 3) If any are ill, inform them of possible exposure, in order to facilitate proper diagnosis and therapy.

Isolation, Work and Daycare Restrictions

Cyclospora infection is not a disease considered for quarantine or isolation under Kansas Administrative Code; however, anyone with diarrhea should be excluded until after the cessation of their symptoms from:

- School and daycare settings
- Food handling (until diarrhea has resolved for 24 hours)
- Direct patient care (subject to food handling restrictions; especially if involved in handling or dispensing meds or in feeding patients)

Case Management

None

Contact Management

Inform ill contact of possible exposure to facilitate proper diagnosis and therapy.

Environmental Measures

If a commercial food service facility, food distributor or public water supply is implicated in transmission. Activities should be coordinated through the proper regulatory agency, including:

- Inspection of the facility.
- Collection of food, drink or water samples and, if necessary, human stool specimens for testing.
- Possible detailed trace-back investigation of any suspect food products.

The agency involved in traceback and inspections will depend on the source of infection. Refer to the [KDHE Foodborne Illness and Outbreak Manual](#).

Education

- 1) As needed, inform of communicability, incubation period and symptoms.
- 2) Provide basic instruction to cases and potentially exposed contacts about:
 - Avoid water or food that may be contaminated with feces.
 - Uncooked fruits and vegetables should be washed thoroughly before eaten.
 - Always thoroughly wash hands with soap and water before handling food, after using the toilet or changing diapers, after handling animal stools (feces), and after gardening or other direct contact with soil.
 - Do not drink water directly from streams, lakes, springs or swimming pools.

- Boil water for 1 minute at a rolling boil whenever you are unsure of the safety of the water.
- 3) Use the Public Health Fact Sheet to assist with education.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

- 1) A single case is actively pursued to identify any outbreaks with unidentified cases associated to the same source. The situation should be treated as a public health emergency until the investigation of additional cases and the possibility of an unidentified contaminated source has been ruled out.
 - Foodborne disease outbreak is defined in the following ways:
 - Two or more individuals (from different households) who experience similar illness after eating a common food or in a common place.
 - An unexplained, unexpected increase of a similar illness and food is a likely source.
 - Waterborne disease outbreak is defined as an incident in which two or more persons epidemiologically-linked persons experience a similar illness after consumption or use of water intended for drinking, and epidemiologic evidence implicates the water as the source of the illness.
 - Other outbreaks may be defined as unexplained, unexpected increase in botulism cases that are clustered in person, place, or time.
- 2) Notify KDHE immediately, 1-877-427-7317.
- 3) Consult [KDHE Foodborne Illness and Outbreak Manual](#) for outbreaks involving food.
- 4) Active case finding will be an important part of any investigation.

B. Reported Incidence Significantly Higher than Usual

- 1) If you suspect an outbreak, investigate to determine the potential source of infection and mode of transmission. Refer to the foodborne investigation manual and consult with the KDHE epidemiologist on-call at 877-427-7317 as they can help determine a course of action to help prevent additional cases; in addition, they can perform surveillance for additional cases across jurisdictional boundaries that would be difficult to detect at a local level.

DATA MANAGEMENT AND REPORTING TO THE KDHE

A. Organize and collect data.

B. Report data via the state electronic surveillance system.

- Especially data that collected during the investigation that helps to confirm or classify a case.

ADDITIONAL INFORMATION / REFERENCES

- A. Treatment / Differential Diagnosis:** American Academy of Pediatrics. 2009 Red Book: Report of the Committee on Infectious Disease, 28th Edition. Illinois, Academy of Pediatrics, 2009.
- B. Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 19th Edition. Washington, DC, American Public Health Association, 2009.
- C. Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: www.cdc.gov/ncphi/diss/nndss/casedef/case_definitions.htm
- D. Quarantine and Isolation:** Kansas Community Containment Isolation/ Quarantine Toolbox Section III, Guidelines and Sample Legal Orders www.kdheks.gov/cphp/comm_containment_sog.htm#attach
- E. Kansas Regulations/Statutes Related to Infectious Disease:** www.kdheks.gov/epi/regulations.htm
- F. KDHE Foodborne Illness and Outbreak Investigation Manual:** [/www.kdheks.gov/epi/download/kansas_foodborne_illness_manual.pdf](http://www.kdheks.gov/epi/download/kansas_foodborne_illness_manual.pdf)
- G. KDHE Foodborne Illness Resources:** www.kdheks.gov/epi/foodborne.htm
- H. Additional Information (CDC):** www.cdc.gov/health/default.htm

Supporting Materials

Fact Sheet

Supporting Materials are available under attachments:

CLICK HERE TO VIEW ATTACHMENTS

Then double click on the document to open.

Other Options to view attachments:

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– OR –

Click on the “Paper Clip” icon on the left.