Tufts University / Tufts Medical Center

Exposure Response Plan for the Laboratory Handling of Cyclospora

Background Information

*Cyclospora cayetanensis* is a one-celled microscopic parasite. The parasite infects the small bowel. Infected people shed oocysts in their feces. *Cyclospora* oocysts excyst in the GI tract. They invade the small bowel epithelia where they undergo asexual division followed by sexual division resulting in mature oocysts that are shed in the stool. This species infects only humans. Other species infect animals. Non-laboratory transmission usually occurs due to the ingestion of oocysts in contaminated food or water.

*Exposure Incident:* Laboratory acquired infections (LAIs) of intestinal protozoa involve inadvertent exposure to infected feces through splashing or other contamination incidents. Direct person-to-person transmission of *Cyclospora* is unlikely as the oocytes shed in the feces mature in the environment. Maturation happens after days to weeks at the appropriate temperature. The infectious inoculum of *Cyclospora* is thought to be less than 100 oocysts. Persons who have been infected with *Cyclospora* can become infected again.

*Reporting Exposure Incidents:* Report all exposures to the Principal Investigator/lab supervisor and seek immediate medical evaluation. If help is needed with injuries or clean up, members of the University will contact the Police at 6-6911 and members of the Medical Center will contact Security at 6-5151. Whenever there is an accident involving *Cyclospora*, the Biosafety Officer must be notified.

Pre-exposure Health Screening:

All employees will receive training on the risks of working with *Cyclospora* and symptoms of exposure by the PI or Occupational Health Professional prior to beginning work with or around this agent.

Due to the limited antibiotics for treatment, allergies or intolerance to sulfa drugs need to be discussed with Occupational Health.

Before an Exposure Incident Occurs:

Immunization for *Cyclospora* is currently not available.

After an Exposure Incident Occurs: Immediate Action by Route of Exposure

*Needlestick, Animal Bite or Laceration:* Wash the area with soap and running water.
Mucous membranes (eye, nose, mouth): If contaminated material is splashed or sprayed contaminating the eyes, nose or mouth: Flush the eyes for 10-15 minutes. Rinse mouth out with clean water and do not swallow. Wash the face being sure that the nasal cavities have been rinsed as much as possible.

Inhalation: If contaminated materials are aerosolized outside of primary containment and potentially inhaled, rinse mouth twice expelling the rinsate. Do not swallow.

Contact with intact skin and clothing: Remove contaminated clothing using gloves and place objects in plastic bags. Although clothing is best disposed of as biological or medical waste, sporulation can be prevented by heating to 140 degrees F or freezing to -18 degrees C. Wash contaminated skin with soap and water.

After an exposure incident occurs: medical evaluation and follow-up:

Following immediate post exposure actions, contact the TMC Employee Health Clinic (Boston), TCSVM Occupational Medical Clinic (Grafton) or the Mt. Auburn Occupational Health Services (Medford) and arrange for medical evaluation, diagnosis and treatment if needed.

During this medical evaluation, the exposed individual may be asked to provide a blood or stool sample, may be educated on the signs or symptoms of Cyclosporiasis, and instructed to watch for the development of these signs and symptoms.

Signs and Symptoms of Cyclosporiasis include:

The parasite typically causes watery stools, with intense cramping and gas. Other common symptoms include:

- loss of appetite,
- weight loss,
- abdominal cramping/bloating,
- increased flatus,
- nausea,
- prolonged fatigue.

Vomiting, body aches, low-grade fever, and other flu-like symptoms may also be noted. If untreated, the illness may last for a few days to a month or longer, and may follow a remitting-relapsing course. Diarrhea may last several months in persons with HIV. Some infected persons are asymptomatic, particularly in settings where cyclosporiasis is endemic.

Diagnostic testing can be difficult. Routine stool specimens are not examined for Cyclospora. Testing must be specifically requested. Oocysts are shed intermittently and at low levels. Several stool specimens may be needed to find oocysts.
**Post-exposure prophylaxis:**

There is currently no post exposure pre-symptom prophylaxis for Cyclosporiasis.

If any individual working with or around *Cyclospora* develops signs or symptoms suggestive of exposure to *Cyclospora*, they must inform their PI and Biosafety Officer immediately. Signs and symptoms usually develop within a week (range 1-14 days) of exposure. The illness usually lasts 6-7 weeks but has been reported to persist for months. The individual must be evaluated at TMC Employee Health (Boston), must notify the TCSVM Occupational Health Nurse who will refer the individual to an Infectious Disease specialist (Grafton), or a physician at Mt. Auburn Hospital Occupational Health Group (Medford).

Massachusetts Department of Public Health classifies Cyclosporiasis as a reportable disease and must be reported to the Local Board of Health immediately by the attending physician. In accordance with Massachusetts regulation, any clinical laboratory identifying an infection caused by a *Cyclospora* species may be reported to the Massachusetts Department of Public Health in accordance with disease-reporting regulations.

If an employee develops signs and symptoms associated with *Cyclospora* exposure in the absence of an exposure incident and appropriate travel history, the PI and Biosafety Officer shall be notified immediately. The infection will be considered laboratory-acquired until proven otherwise.