Tufts University/Tufts Medical Center

Exposure Response Plan for the Laboratories Handling *Clostridium difficile*

**Background Information**

*C. difficile* is a gram positive, spore-forming rod that may naturally reside in the gut. Neonates can be asymptomatic carriers. Adult infections are generally associated with antibiotic usage. Antibiotics kill off beneficial gut bacteria leading to an overpopulation of *C. diff*. When *C. diff* grows, the bacteria secrete toxins which affect the intestinal wall and cause the symptoms of disease. Although the spore form does not directly cause disease, ingestion can cause the spores to activate. Severe colitis can result in death.

Bacteria may be transmitted person to person. Infection does not guarantee immunity and a recurrence increases the risk of subsequent recurrences. Contaminated surfaces and hands are implicated in transmission. Spores are resistant to many disinfectants. The infectious dose is unknown but is thought to be less than 10 organisms.

*Exposure Incident:* Although only one has been reported, laboratory acquired infections may result from inhalation/ingestion and accidental parenteral inoculation. If you work with or around this agent, make your healthcare provider aware of this.

*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 6-5100. Whenever there is an accident involving *C. difficile*, the Biosafety Officer must be notified.

**Pre-exposure Health Screening:**

Prior to beginning work with or around *C. diff*, the PI or an Employee Health Professional will inform each person of the risks s/he takes and of the symptoms s/he may experience following exposure.

**Before an Exposure Incident Occurs:**

A vaccine for *C. difficile* is not available. A number of clinical trials focused on treatment are underway and involve monoclonal antibodies, antibodies to toxin, antibiotics, probiotics, substances that absorb toxin and fecal transplants.

All immunocompromised employees who might potentially be exposed to *C. diff* during routine work are advised to self-identify to Employee Health Clinic (Boston) or Occupational Medical Clinics (Grafton/Medford) for further evaluation and discussion of the specific risks associated with immunodeficiency and exposure to *Clostridium difficile*. Review antibiotic use with the health care provider.
Use of medications that suppress gastric acid production is associated with increased risk of disease.

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

**Needlestick, Animal Bite or Laceration:** Wash the area with soap and running water. Alcohol based cleansers are not effective against spores.

*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.

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

**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 appointment, the exposed individual will be informed of the signs and symptoms associated with *C. diff*, and will be instructed to watch for the development of these signs and symptoms. Drugs to stop diarrhea frequently worsen the colitis and should be avoided. Delayed diagnosis appears to elevate the risk of death. Multiple methods may be used to diagnose an infection. Routine stool cultures don’t differentiate between toxigenic and non-toxigenic strains. Toxigenic culture is both sensitive and specific although slow and labor intensive. Toxin is unstable and degrades within two hours after stool collection at room temperature. The incubation period is unknown. The agent can colonize the GI system without causing clinical symptoms.

**Signs and Symptoms vary by route:**

- **Ingestion/GI**
  - Watery diarrhea (at least three bowels movements for two or more days)
  - Fever
  - Nausea/vomiting
  - Abdominal pain/tenderness
  - Dehydration

- **Inhalation**
  - Irritation
  - Cough
  - Shortness of breath

- **Mucous membranes**
  - Irritation
  - Redness
p<o> pain

**Post-exposure prophylaxis:**

Current broad-spectrum antibiotics may be discontinued.

Pre-symptom prophylaxis is not routinely given to immunocompetent persons.

Massachusetts Department of Public Health does not classify infection with *C. difficile* as a reportable disease. The Department of Public Health retains the prerogative to investigate outbreaks.

If an employee develops signs and symptoms associated with *C. diff* exposure in the absence of an exposure incident, the PI and Biosafety Officer shall be notified immediately. Infection will not be considered laboratory-acquired until proven otherwise.