

Tufts University / Tufts Medical Center

Exposure Response Plan for the Laboratory Handling of *Borrelia burgdorferi*

Background Information

Borrelia burgdorferi is a spirochete (bacterium) transmitted by a tick in nature. Ticks can become infected if they feed on small animals that are infected. The tick must bite a person and stay attached for approximately 36 hours before transmitting the spirochete. A person may be reinfected if bitten by another infected tick after an initial successful treatment. In 2/3 – 3/4 of cases, a characteristic rash appears near or around the bite, generally within 3-14 days post bite although the time can extend to 32 days.

Exposure Incident: Laboratory acquired infections (LAIs) can be acquired through percutaneous exposure; needlestick, broken glass or tick bite. Other exposures, such as exposure of intact skin or mucous membranes, are thought to be very low risk. The infectious dose is unknown. LAIs have been reported for other *Borrelia* species.

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 Tufts Medical Center will contact Security at 6-5100. Whenever there is an accident involving *Borrelia*, the Biosafety Officer must be notified.

Pre-exposure Health Screening:

Prior to beginning work with or around *Borrelia burgdorferi*, 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:

Immunization for *Borrelia burgdorferi* is not currently available in the US.

A FDA licensed vaccine came on the market in December 1998. One year later a class action law suit was filed and claimed a degenerative autoimmune syndrome was triggered by the vaccine in people with a specific HLA marker. In February 2002, the maker announced a production stoppage. If the vaccine was received prior to 2002, protection has likely waned.

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

Needlestick 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.

Tick Removal: Use fine-tipped tweezers and protect your fingers with gloves. Avoid removing ticks with your bare hands. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal. After removing the tick, thoroughly clean the bite and your hands with rubbing alcohol, an iodine scrub, or soap and water.

Inhalation: If liquids or powder are aerosolized outside of the biosafety cabinet and inhaled, rinse mouth twice expelling the rinsate. Do not swallow.

Contact with intact skin and clothing: Remove contaminated clothing using gloves and place clothing in an autoclave bag. Autoclave and then launder. 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 appointment, the exposed individual will be informed of the signs and symptoms of Lyme disease and will be instructed to watch for the development of these signs and symptoms. A two-tiered antibody test is available. Initial testing is an ELISA test that requires a blood sample. A Western blot is performed if the initial test is positive or borderline. An infected person may require several weeks to test positive to both tests.

Signs and Symptoms of Lyme disease (Borreliosis) Include:

Early localized stage (3-30 days post tick bite):

- Red, expanding rash called erythema migrans (EM) (majority of people - fewer people having the Bull's eye rash)
- Fatigue, chills, fever, muscle/joint aches, swollen lymph nodes
- One of the above or both of the above

Early disseminated stage (days to weeks post bite):

- EM rash on other body areas
- Loss of muscle tone on one or both sides of the face
- Severe headaches or neck stiffness
- Pain and swelling in large joints (e.g. knees)

Late disseminated stage (months to years post bite):

- Intermittent arthritis with severe joint pain/swelling
- Chronic neurologic complaints; shooting pains, numbing/tingling of hands/feet
- Problems with short term memory

If an exposed individual experiences signs or symptoms of Lyme disease, s/he must immediately notify the PI and the campus Biosafety Officer. S/he also must be evaluated at TMC Employee Health Clinic (Boston), referred to an ID specialist by the TCSVM Occupational Health nurse (Grafton), or evaluated by a physician at the Mount Auburn Occupational Health Services (Medford).

Post-exposure prophylaxis:

Laboratory tests are not recommended when typical Lyme disease symptoms are absent.

Massachusetts Department of Public Health classifies Lyme disease as a reportable disease and must be reported to the Local Board of Health immediately by the attending physician.

If an employee develops signs and symptoms associated with Lyme disease 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.