**Rickettsia prowazekii** (Epidemic Typhus) Exposure Medical Response Guidance for the University of Wisconsin-Madison

**1.0 Instructions:** Information in this guidance is meant to inform both laboratory staff and health professionals about the risks and treatment in the event of an infectious agent exposure. In using this guidance, please consider that multiple routes of exposure may occur in a lab and that organism strains will sometimes be genetically modified to incorporate traits such as antimicrobial resistance. Research protocols and other available guidance such as Health Canada material safety data sheets will be provided as supporting information when available. It should be assumed that when exposures do occur, that the healthcare provider will be provided with information about the specific strain involved, route of exposure, inoculum concentration, and victim vaccination and serological status, when available. This document was developed by UW Occupational Medicine in consultation with the UW Department of Infectious Disease. The information provided below is intended to provide guidance for treating physicians. Treatment and evaluation plans should be individualized to the patient based on the patient’s symptoms, exposure risk, and underlying health status.

If there are any questions about this document, please contact University Health Services, Occupational Medicine at 265-5610.

**2.0 Signs and Symptoms of Infection:** Describe signs and symptoms associated with the agent.

**Rickettsia prowazekii** is an obligate, intracellular, gram negative bacteria which causes Epidemic Typhus, an historically important disease. The human body louse, *Pediculosis humanus*, is the arthropod vector which transmits the organism from an infected individual to a new host. Epidemic Typhus is considered to be a disease of conditions favoring lice infestation including war, famine, migration and poor sanitation with crowding.

Epidemic typhus is a louse borne disease with humans the primary reservoir, although there is also an animal reservoir in the flying squirrel of the southern US. Endemic foci today include remote areas in Central and South America, Africa, and Asia.

Epidemic typhus typically presents with 1-3 days of malaise followed by headache, chills, prostration, fever and generalized pain. A macular, papular, or petechial rash, appears on day five or six, starting in the axillae and spreading centrifugally to the trunk and extremities. The rash spares the palms, soles, and face and may be difficult to see on dark pigmented skin. Information available on lab acquired typhus does not indicate any differences in the clinical course. Without treatment, symptoms last for 2 weeks or more and the case fatality rate is 10-40 %. Complications leading to death include myocarditis, and muscle, spleen, kidney and brain damage.
3.0 Infectivity - Describe infective dose, relevant exposure routes (considering laboratory use), incubation period and potential severity of infection.

The incubation period for epidemic typhus is commonly 12 days and ranges from 1 to 2 weeks.

One report notes 56 cases of laboratory associated epidemic typhus with 3 deaths. Cases were associated with handling of infectious materials on the open bench, accidental parenteral inoculation, and exposure to infectious aerosols.

4.0 Description of First Aid - Provide an overview of first aid treatment of exposures considering that multiple routes of exposure could occur (needlestick, aerosol, eye, skin and ingestion).

First Aid:
Cleanse exposed area for minimum of 15 minutes – as soon as possible following exposure.
- **Skin:** scrub with the antibacterial scrub approved for the laboratory for 15 minutes.
- **Eye or mucus membranes:** Use sterile saline or water to irrigate for 15 minutes, preferably in an eye wash station.

5.0 Urgency of Medical Care - Describe how soon medical attention should be sought, i.e. is an ER visit necessary, visit to University Health, or simply schedule a visit with a personal physician.

All exposures, after initial first aide, should be immediately reported to UW-Madison RO or ARO's (Responsible Official or Alternate Responsible Official) and PI. RO/ARO's can be reached at their direct office numbers or through the UW-Madison Police Department at 262-2957 or by dialing 9-1-1. RO/ARO will contact UW Infectious Disease to arrange for appropriate medical attention and notify UHS Occupational Medicine (608-262-5610 or 608-252-0955). Follow-up evaluation should be sought within 24 hours.

6.0 Description of Medical Response - Provide an overview for clinical treatment of exposures to the agent considering that multiple routes of exposure could occur (needlestick, aerosol, eye, skin and ingestion) and that strains of agents will vary and sometimes include antimicrobial resistance.

Louse born typhus can be cured with a single dose of doxycycline (200 mg doxycycline orally is generally recommended). Treatment is generally begun empirically prior to results of laboratory testing becoming available. Definitive diagnosis is made primarily by acute and convalescent serology. Culture or PCR may also be considered.

Following an exposure incident or accident, the laboratory worker should be evaluated by either UW Infectious Disease or the UW University Health Services -Occupational Medicine for consideration of prophylactic treatment. Additionally, because of the proven value of antibiotic therapy early in the course of disease, laboratory personnel working with Rickettsiae prowazekii and developing a febrile illness, particularly
associated with headache, malaise and prostration, should also be medically evaluated.

Prophylactic treatment in outbreaks minimizes the potential for infection. Individuals working in epidemic typhus areas of the world have been advised to treat prophylactically with 200 mg of doxycycline po once a week and for one week following return from the area. This regimen might also be considered.

7.0 Description of Medical Surveillance- Describe the advisability of medical surveillance strategies (in particular baseline and annual serology) for those working with the agent. If doing so would likely improve the identification, diagnosis or treatment of exposures, please indicate so.

No routine surveillance is recommended.

8.0 Considerations for Infection Control- Describe any special precautions required to prevent the further spread of infection. Include precautions for the healthcare, workplace, and home setting.

Epidemic typhus is not transmissible person to person unless there is direct percutaneous inoculation.

In epidemic typhus outbreaks, the lice of patients are infective during their febrile illness and for 2-3 days after. Infected lice pass rickettsiae in their feces within 2-6 days of their human blood meal and die within 2 weeks after infection. The rickettsiae may remain viable in the dead louse for weeks.

In epidemics, susceptible persons infested with lice and exposed to typhus fever are quarantined for 15 days. This would not apply to laboratory acquired infections.

Vaccine for Epidemic Typhus is not currently available.

9.0 Reporting- Describe any state public health or federal regulatory reporting requirements. Include the timing and mechanism for reporting.

Public Health: Epidemic typhus is not specifically listed as a reportable disease by the state of Wisconsin, although a laboratory associated case would fall under the criteria of a Category II occupationally related disease and it should be reported to the State of Wisconsin Bureau of Communicable Disease.

Other: Exposure or potential exposure will be reported to the state health department communicable disease section by the Responsible Official at 608-267-9003(7:45 AM-4:30 PM) or through the 24 hour WI health department clinical emergency contact number 608-258-0099 (after hours). The CDC Division of Select Agents and Toxins will also be notified by the Responsible Official. Louse borne typhus fever is reportable under WHO criteria.

10.0 References:
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## 11.0 Document Revisions

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