Background Information

*Measles* (rubeola) is a highly contagious viral disease. This single stranded RNA virus is surrounded by an envelope. Two envelope proteins are important in pathogenesis. There is no known animal reservoir and an asymptomatic carrier state has not been documented. Current research with the virus includes improving the vaccine, basic biology and using the virus to attack cancer cells.

One source lists the infectious dose as 0.2 units by intranasal spray. Laboratory acquired infections are rare despite person-to-person transmission of disease. *Measles* is a common disease in developing countries. The Americas and Europe see outbreaks from imported cases as well as unvaccinated populations. An infection during pregnancy can result in a spontaneous abortion, premature birth or a low birth weight infant. Some surviving infants will develop a mild disease. More severe complications include pneumonia.

*Reporting Exposure Incidents:* Report all exposures to the Principal Investigator or 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 *measles*, the Biosafety Officer must be notified. Immunization is effective up to 72 hours post-exposure to prevent measles in unvaccinated persons. *Measles* immunoglobin may also be considered between 72 hours post-exposure and 6 days post exposure as well as in select circumstances.

Pre-exposure Health Screening:

Prior to beginning work with or around *measles*, 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. Additionally, all persons working with measles must be screened by Occupational Health.

Before an Exposure Incident Occurs:

A safe live attenuated vaccine is available. However it is not single antigen. The vaccine given to adults is combined with mumps and rubella vaccines. Persons who work in medical facilities are at higher risk of exposure than the general population and are likely to be screened in Occupational Health programs. Pregnant women should not receive the vaccine and should avoid pregnancy for 4 weeks following vaccination. Severely immunosuppressed persons should not be vaccinated. Please discuss your immune status and concerns with Occ. Health.

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

*Inhalation:* If contaminated materials are aerosolized outside of primary containment and potentially inhaled, rinse mouth twice expelling the rinsate. Do not swallow. Evacuate area. Droplets remain infective for at least an hour.

*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.
**Needlestick, Animal Bite or Laceration:** Wash the area with soap and running 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 measles, and will be instructed to watch for the development of these signs and symptoms. Measles is highly contagious; you may be asked to call the HCP prior to an in person consultation to help minimize the risk to others. Measles can be transmitted 4 days before to 4 days after rash onset. The incubation period is generally 10-12 days. From exposure to rash onset averages 14 days.

During the appointment you may be asked to provide a blood specimen to use in ELISA testing for IgM antibody. Specimens for viral isolation may also be collected per a CDC protocol and sent to CDC or the State Lab.

**Signs and Symptoms:**

- Stepwise increase in fever to 103°F or higher
- Cough, runny nose, conjunctivitis
- Koplik spots (rash in the mouth; blue-white spots on bright red background; occurs 1-2 days before body rash to 1-2 days after; considered diagnostic)
- Rash (beginning on head/face; discrete spots may merge, persists for 5-6 days, fades in order of appearance)

**Complications**

- Pneumonia (viral or bacterial; most common cause of death)
- Acute encephalitis (inflammation of the brain; headache, vomiting, stiff neck)
- Subacute scherosing panencephalitis (rare degenerative nervous system disease thought to be caused by persistent brain infection; insidious onset resulting in death generally 7-10 years after a measles infection)

**Post-exposure:**

The healthcare provider will determine the course of treatment. Disease usually requires supportive care.

The disease must be reported to the Massachusetts Department of Public Health. Measures to minimize the chance of an outbreak may be implemented. In 2006 at least 1,000 people were told to stay home for 16 days if they couldn’t provide proof of immunity when a virus outbreak stemmed from an Indian computer programmer who came to work at Investors Bank and Trust. Vaccination clinics were held in 2011 after cases in Boston’s Park Square Building.

If an employee develops signs and symptoms associated with measles in the absence of an exposure incident, the PI and Biosafety Officer shall be notified immediately. In the absence of relevant outbreak and vaccination information, the infection will be considered laboratory-acquired.