Occupational Health - Zoonotic Disease Fact Sheet

TUBERCULOSIS (TB)

KEY FACTS:

- Tuberculosis is caused by a bacterium called Mycobacterium tuberculosis.
- On March 24, 1882, Dr. Robert Koch announced the discovery of Mycobacterium tuberculosis, the bacteria that causes TB.
- Many species are in existence and a variety of animals can be affected.
- According to the World Health Organization, while TB is curable, it kills roughly 5000 people a day and results in nearly 2000 deaths a year worldwide.

SPECIES: Humans, and non-human primates, but also nearly all other species used in the lab are susceptible

CAUSATIVE AGENT: Tuberculosis is caused by a variety of bacterial species in the Genus *Mycobacterium.* The major species that cause diseases in humans and animals include *tuberculosis* (humans and non-human primates)*, bovis* (cattle, dogs, swine), and *avium* (birds, swine, sheep).

TRANSMISSION: *Mycobacterium spp*. are transmitted from infected animals or infected tissue primarily via the aerosol route. May also be contracted via ingestion or cutaneous inoculation of the bacilli. Personnel caring for infected animals as well as those performing necropsies on infected animals are at risk for contracting the disease. Exposure to dusty bedding of infected animals, coughing of infected animals, and aerosolization of the organism during sanitation procedures may also be sources of the disease in the laboratory environment. Once within the body the organism may spread throughout the lungs, lymphatics, blood vascular system, and many visceral organs.

DISEASE IN ANIMALS: The signs of TB may be insidious with only slight behavioral changes noticed, followed by anorexia and lethargy. Animals often die suddenly while appearing to be in good health. Other signs which might be seen include diarrhea, suppuration of lymph nodes, ulceration of the skin, and palpable splenomegaly and hepatomegaly. The organ of predilection is the lung but lesions may also be seen in the pleura, intestines, lymph nodes, liver, kidney, spleen, and peritoneum. Under the surface of these tissues are yellowish-white to gray nodules filled with caseous material which may rupture and produce cavitation. Although skeletal involvement in primates is rare, tuberculosis of the spine may cause paralysis of the hindlimbs (Pott's disease).

DISEASE IN HUMANS: In humans the clinical signs depend on the organ system involved. The most familiar signs related to pulmonary TB are cough, sputum production, and hemoptysis. The patient may be asymptomatic for years. General signs may include anorexia, weight loss, lassitude, fatigue, fever, chills, and cachexia. Skin lesions are characterized by ulcers or by papular lesions progressing to dark suppurative lesions. TB may affect virtually every other

organ system with signs or symptoms relating to the individual system. Miliary TB is most often seen in the very young and old people.

DIAGNOSIS: The diagnosis of TB is often difficult. Four tests are commonly used for presumptive diagnosis: 1. Intradermal TB test - Mammalian tuberculin 2. Radiography 3. Acid fast stained sputum smear 4. ELISA Confirmation by culture, histopath, or animal inoculation. *Please review current literature before prescribing diagnostic testing as recommendations may have changed.*

TREATMENT: Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection and TB disease. Both latent TB infection and TB disease can be treated. Regimens currently accepted in the United States for treatment of latent TB include isoniazid combined with rifampin. Treatment options for TB disease include isoniazid, rifampin, ethambutol, and pyrazinamide. *Please consult your physician for treatment options as recommendations may have changed.*

PREVENTION/CONTROL: Multifaceted and includes: personnel education regarding wearing protective clothing when handling nonhuman primates, a health surveillance program for humans and nonhuman primates, isolation and quarantine of suspect animals, rapid euthanasia, and careful disposal of infected animals. To prevent and control unintended infections, use uninfected animals for research, and isolate any animals used in clinical trials. Additionally, only conduct projects in laboratories with proper engineering controls and train staff members in the proper use of required personal protective equipment, to include respiratory protection, when they are in spaces containing live agent.

More information on Tuberculosis can be found on the Centers for Disease Control and Prevention website at: https://www.cdc.gov/tb/