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Office of  
Laboratory  
Security

MSDS

**MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES****SECTION I - INFECTIOUS AGENT****NAME:** *Clostridium tetani***SYNONYM OR CROSS REFERENCE:** Lockjaw, tetanus**CHARACTERISTICS:** Gram positive sporeforming rod; single, spheric, terminal endospore; clubbed appearance; strict anaerobe; swarming on blood agar grown anaerobically; produces an exotoxin (tetanospasmin)**SECTION II - HEALTH HAZARD****PATHOGENICITY:** An acute disease induced by a neurotoxin; painful muscular contractions, primarily of neck muscles, secondarily of trunk muscles; abdominal rigidity, generalized spasms; 30-90% case fatality rate**EPIDEMIOLOGY:** Worldwide; sporadic and relatively uncommon in North America and industrial countries; more common in agricultural regions and underdeveloped areas where contact with animal excreta is likely and immunization is inadequate; important cause of death in tropical areas; drug addict cases**HOST RANGE:** Humans, animals**INFECTIOUS DOSE:** Toxin is extremely potent**MODE OF TRANSMISSION:** Tetanus spores introduced into the body through a wound contaminated with soil, street dust or feces, or injected street drugs; also through lacerations, burns and trivial wounds**INCUBATION PERIOD:** Usually 3-21 days; average 10 days; shorter incubation periods are associated with more heavily contaminated wounds**COMMUNICABILITY:** Not directly transmitted from person to person**SECTION III - DISSEMINATION****RESERVOIR:** Intestine of animals and humans; soil contaminated with animal and rarely human feces**ZOONOSIS:** Yes - wound contamination with soil or feces (agricultural workers subject to cuts, especially where herbivore animals are raised)**VECTORS:** None**SECTION IV - VIABILITY**

**DRUG SUSCEPTIBILITY:** Generally susceptible to many antibiotics, including penicillin G, chloramphenicol, metronidazole, piperacillin and imipenem

**DRUG RESISTANCE:** Resistant to the aminoglycosides

**SUSCEPTIBILITY TO DISINFECTANTS:** Spores are resistant to many disinfectants; moderately susceptible to sodium hypochlorite; susceptible to high level disinfectants such as glutaraldehyde with a prolonged contact time

**PHYSICAL INACTIVATION:** Spores are fairly resistant to heat but are destroyed after 15 min contact with moist heat (121°C)

**SURVIVAL OUTSIDE HOST:** Manure - several days; soil - spores survive long periods; textiles - 730 days

## SECTION V - MEDICAL

**SURVEILLANCE:** Monitor for symptoms; no detectable antibody response and organism is rarely recovered from site of infection

**FIRST AID/TREATMENT:** Tetanus immune globulin (TIG) as soon as possible following the wound; if not available, tetanus antitoxin (equine origin) following testing for hypersensitivity; wound should be debrided and excised; mechanically assisted respiration may be necessary

**IMMUNIZATION:** Active immunization with adsorbed tetanus toxoid; generally administered together with diphtheria toxoid administered at 10-year intervals

**PROPHYLAXIS:** Prophylaxis in wound management: booster dose of toxoid if more than 10 years have elapsed; passive immunization with TIG; depends on whether wound is clean or contaminated, the immune status of patient. Antibiotics not effective

## SECTION VI - LABORATORY HAZARDS

**LABORATORY-ACQUIRED INFECTIONS:** Risk is low; 5 incidents related to exposure of personnel during manipulation of toxin

**SOURCES/SPECIMENS:** Clinical specimens - wound exudates

**PRIMARY HAZARDS:** Accidental parenteral inoculation and ingestion of the toxin; it is unclear whether tetanus toxin can be absorbed through mucous membranes; hazards associated with aerosols and droplets are not fully understood

**SPECIAL HAZARDS:** None

## SECTION VII - RECOMMENDED PRECAUTIONS

**CONTAINMENT REQUIREMENTS:** Biosafety level 2 practices, containment equipment and facilities for activities involving the manipulation of cultures or toxin

**PROTECTIVE CLOTHING:** Laboratory coat; gloves when direct contact with infectious materials is unavoidable

**OTHER PRECAUTIONS:** None

### SECTION VIII - HANDLING INFORMATION

**SPILLS:** Allow aerosols to settle; wear protective clothing; gently cover spill with paper towels and apply a suitable disinfectant (high level for spores, or 1% sodium hypochlorite), starting at perimeter and working towards the centre; allow sufficient contact time (30 min) before clean up

**DISPOSAL:** Decontaminate before disposal; steam sterilization, chemical disinfection, incineration

**STORAGE:** In sealed containers that are appropriately labelled

### SECTION IX - MISCELLANEOUS INFORMATION

**Date prepared:** January 2000

**Prepared by:** Office of Laboratory Security, PHAC

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