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MSDS

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MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Bacillus anthracis*

SYNONYM OR CROSS REFERENCE: Anthrax, woolsorters' disease

CHARACTERISTICS: Aerobic, large Gram positive rods occurring in chains; non-motile; forms resistant spores

SECTION II - HEALTH HAZARD

PATHOGENICITY: Cutaneous anthrax - skin lesion becoming papular, then vesiculated and developing into a depressed eschar (5-20% case fatality in untreated cases); inhalation anthrax - respiratory distress, fever and shock with death shortly thereafter; intestinal anthrax - abdominal distress followed by fever, septicemia and death (rare); oropharyngeal form described

EPIDEMIOLOGY: Infrequent and sporadic in most industrial countries; occupational hazard of workers who process hides, hair, wool, bone and bone products; of laboratory workers and of veterinarians and agricultural workers who handle infected animals; endemic in agricultural regions where anthrax in animals is common (Africa, Asia and Middle East)

HOST RANGE: Humans, cattle, sheep, goats, horses, pigs

INFECTIOUS DOSE: 8,000 to 50,000 organisms by inhalation

MODE OF TRANSMISSION: Infection of skin by contact with infected animal tissues and possible by biting flies feeding on such animals, or by contaminated hair, wool, hides or products made from them; inhalation anthrax results from inhalation of spores in contaminated soil areas, dried or processed skins and hides of infected animals; intestinal anthrax from ingestion of contaminated undercooked meat

INCUBATION PERIOD: Within 7 days of exposure, usually 2 to 5

COMMUNICABILITY: Transmission from person to person is very rare

SECTION III - DISSEMINATION

RESERVOIR: Spores are resistant to adverse environmental conditions and remain viable for years in soil, dried or processed hides

ZOONOSIS: Yes - disease spreads among grazing animals through contaminated soil and feed and among omnivorous and carnivorous animals

through contaminated meat, bone meal or other feed; vultures have been reported to spread the organism from one area to another

VECTORS: Infection of skin may possibly occur through biting flies which had fed on infected animals

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Susceptible to penicillin (except for inhalation anthrax in which the mortality remains high); ciprofloxacin, doxycycline, tetracyclines, erythromycin, chloramphenicol

SUSCEPTIBILITY TO DISINFECTANTS: Spores are resistant to many disinfectants; susceptible to 2% glutaraldehyde formaldehyde and 5% formalin (overnight soak preferable)

PHYSICAL INACTIVATION: Spores are highly resistant to drying, heat, and sunlight; adequate sterilization requires direct exposure to 121°C for at least 30 min

SURVIVAL OUTSIDE HOST: Spores remain viable in soil, skins and hides of infected animals and contaminated air and wool for decades; survival in milk - 10 years; dried on filter paper - 41 years; dried on silk threads - up to 71 years; pond water - 2 years

SECTION V - MEDICAL

SURVEILLANCE: Monitor for suspicious skin lesions and other symptoms; laboratory confirmation through direct microscopy, culture, immunological techniques

FIRST AID/TREATMENT: Prompt treatment with high-dose antibiotics

IMMUNIZATION: Vaccine available through the Centers for Disease Control and Prevention and is recommended for those workers with frequent exposure to clinical specimens and cultures; vaccination of cattle or other livestock may be justified in anthrax-endemic areas

PROPHYLAXIS: Antibiotic treatment (oral ciprofloxacin or doxycycline)

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 45 cases with 5 deaths occurring primarily in facilities conducting anthrax research; 25 reported cases of cutaneous anthrax among armed forces personnel

SOURCES/SPECIMENS: Blood, skin lesion exudates, and rarely in urine and faeces; hides, hair, wool, bone and bone products, and tissues from infected animals

PRIMARY HAZARDS: Direct and indirect contact of skin with cultures and contaminated laboratory surfaces; accidental parenteral inoculation; exposure to infectious aerosols

SPECIAL HAZARDS: Naturally and experimentally infected animals pose a risk to laboratory and animal care personnel

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 3 practices and facilities are recommended for work with anthrax; Agriculture Canada may also require special conditions for the use or importation of this agent

PROTECTIVE CLOTHING: Use of adequate protective clothing (gloves, gowns with tight wrists and ties in back) and facilities for washing and changing clothes after work

OTHER PRECAUTIONS: Care of skin abrasions and proper handling of potentially contaminated articles is essential

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with paper towels and apply suitable disinfectant (glutaraldehyde, formalin), starting at the perimeter and working towards the centre; allow sufficient contact time before clean up

DISPOSAL: Incineration or steam sterilization of cultures and infected materials; animals that have died from anthrax should be burned or deeply buried and covered with lime

STORAGE: In sealed containers that are appropriately labelled and secured in a level 3 facility

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: November 1999

Prepared by: Office of Laboratory Security, PHAC

Although the information, opinions and recommendations contained in this Material Safety Data Sheet are compiled from sources believed to be reliable, we accept no responsibility for the accuracy, sufficiency, or reliability or for any loss or injury resulting from the use of the information. Newly discovered hazards are frequent and this information may not be completely up to date.

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