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Office of
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Security

MSDS

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Japanese encephalitis virus*

SYNONYM OR CROSS REFERENCE: JE, JEV, Japanese B encephalitis (JBE), Arbovirus B, Mosquito-borne encephalitis virus

CHARACTERISTICS: Single stranded, positive sense RNA, enveloped, 40-50 nm diameter, Family Flaviviridae (formerly Togaviridae); prototype member of Japanese encephalitis antigenic complex which also contains St. Louis encephalitis virus, Murray valley virus, and West Nile virus

SECTION II - HEALTH HAZARD

PATHOGENICITY: Acute inflammatory viral diseases of short duration involving parts of the brain, spinal cord and meninges; ranges from febrile headache syndrome to acute encephalitis; severe infections are marked by acute onset, headache, high fever, chills, nausea, and vomiting followed by nuchal rigidity, photophobia and objective neurologic signs, stupor, disorientation, coma, tremors, convulsions in children, and paralysis of the upper extremities; infants and elderly more likely to develop severe cases; fatality rate of 5-40%; 45-70% of severe cases develop neuropsychiatric sequelae, parkinsonism, convulsive disorder, paralysis, mental retardation

EPIDEMIOLOGY: JE in western Pacific islands from Japan to the Philippines and in many areas of Asia from Korea to Indonesia, China and India; cases occur in temperate latitudes in summer and early fall, and are limited to areas and years of high temperature and many mosquitoes

HOST RANGE: Humans, birds, pigs, cattle, horses, bats and reptiles

INFECTIOUS DOSE: Unknown

MODE OF TRANSMISSION: By the bite of infective mosquitoes

INCUBATION PERIOD: Usually 5-15 days

COMMUNICABILITY: Not directly transmitted from person-to-person; virus is not usually demonstrable in the blood of human after onset of disease, but can be isolated from the CNS fluid in 1/3 of acute cases; viremia in birds usually lasts 2-5 days; mosquitoes are infective for life; viremia in horses rarely present in high titer for long periods

SECTION III - DISSEMINATION

RESERVOIR: Pigs and birds are the major amplifying hosts; humans, horses and cattle are uncommon sources of mosquito infection; virus possibly overwinters in birds, other animals, mosquitoes;

ZOONOSIS: Yes, from infected animals via mosquito bites; causes encephalitis in horses, spontaneous abortion and stillbirths in swine

VECTORS : *Culex* spp. and *Aedes* spp.

Most important vectors are:

- Culex tritaeniorhynchus* (major epidemic vector)
- Culex vishnui* complex -*Culex gelidus* (in the tropics)
- Culex fuscocephalus* -*Culex annulus*

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Unknown

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to disinfectants - 70% ethanol, 2% glutaraldehyde, 3-8 % formaldehyde, 1% sodium hypochlorite, iodine, phenol iodophors and organic solvents/detergents

PHYSICAL INACTIVATION: Inactivated by heat; 50% reduction in 10 min at 50° C, complete inactivation in 30 min at 56° C; sensitive to UV and gamma irradiation

SURVIVAL OUTSIDE HOST: Survives for long periods in mosquito eggs (virus can be maintained overwinter in eggs)

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms, serological studies (detection of immunoglobulin M and G antibodies) or isolation of virus from blood, CSF or other body fluid

FIRST AID/TREATMENT: No specific treatment

IMMUNIZATION: Formalin inactivated vaccine (JE-VAX) is licensed in Canada and recommended for those of increased risk such as laboratory workers and travellers spending more than one month in endemic/epidemic areas during the transmission season; 3 doses of the vaccine scheduled on days 0, 7 and 30 are required for a good protection; vaccine is contraindicated for women who are pregnant and the immunocompromised; two live vaccines are licensed for use in China.

PROPHYLAXIS: Passively protect accidentally exposed laboratory workers by human or animal immune serum

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 22 cases reported up to 1980 and no fatalities

SOURCES/SPECIMENS: Blood, cerebrospinal fluid (CFS), other tissues (brain), infected arthropods

PRIMARY HAZARDS: Direct contact with broken skin or mucous membranes, accidental parenteral inoculation, exposure of infectious aerosols

SPECIAL HAZARDS: Bites or scratches from experimental animals, including arthropods (mosquitoes)

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 3 practices, containment equipment, and facilities are recommended for all activities involving potentially infectious materials and infected tissue cultures, animals, or arthropods

PROTECTIVE CLOTHING: Laboratory coat, gloves and gown (tie in back and tight wrists) must be worn when working with infectious materials

OTHER PRECAUTIONS: Vaccination of personnel working directly and regularly with the JE; important precautions concerning needle safety - do not

bend, break or recap needles and dispose directly into puncture-proof container

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, the spillage must be covered promptly with a paper towel and disinfectant poured gently on towel, working from the outside to inwards; allow sufficient contact time (30 min) before clean up

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

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

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: March, 2001

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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