

# MATERIAL SAFETY DATA SHEET

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## SECTION I - INFECTIOUS AGENT

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**NAME:** Metapneumovirus

**SYNONYM OR CROSS REFERENCE:** MPV

**CHARACTERISTICS:** Metapneumovirus (MPV) is a negative single-stranded RNA virus in the Pneumovirinae subfamily of the Paramyxoviridae family. Two major groups (A and B) and 4 subgroups of MPV have been identified to date. The genomic organization of MPV is analogous to RSV, however, MPV lacks the nonstructural genes, NS1 and NS2.

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## SECTION II - HAZARD IDENTIFICATION

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**PATHOGENICITY/TOXICITY:** MPV primarily infects human epithelial cells within the nasopharynx; however, it can also infect other types of cells, including cell lines, but with much lower efficacy. Primary infection with MPV is generally exhibited as lower respiratory tract disease, pneumonia, bronchiolitis, tracheobronchitis, or upper respiratory tract illness. Common clinical symptoms include rhinorrhea, sneezing, cough, pharyngitis, bronchitis, headache, fatigue, and fever. MPV infections usually begin with upper respiratory tract disease, which has the tendency to progress to lower respiratory tract disease. Severe infection (involving pneumonia) may develop among elderly patients with underlying respiratory conditions.

**EPIDEMIOLOGY:** The virus is distributed worldwide and has a seasonal distribution during winter. MPV is the second most commonly identified cause of pediatric lower respiratory illness, behind only RSV. Infection with human metapneumovirus tends to occur in slightly older children and to produce disease that is less severe. However, small children, elderly and immunocompromised individuals are at risk of severe disease and hospitalization. By the age of five, virtually all children have been exposed to the virus and reinfections are common.

**HOST RANGE:** Humans; however, various animal species can be experimentally infected with MPV including ferrets, hamsters, nonhuman primates, and birds.

**INFECTIOUS DOSE:** The infectious dose for MPV is ~500 viral units, administered through intranasal spray, as listed by the National Institutes of Health.

**MODE OF TRANSMISSION:** MPV is most likely transmitted through direct contact with infectious secretions (via fomites) and/or large-particle aerosols; however, close contact with infected individuals, or significant exposure of nasal or conjunctival mucosa with contaminated hands is required for transmission. Transmission via small-particle aerosols is less likely.

**INCUBATION PERIOD:** Incubation period for MPV infection ranges from 2 to 8 days.

**COMMUNICABILITY:** Communicable during the period of active disease. The disease is likely not readily transmitted from person-to-person, since significant and prolonged contact is required with infected individuals. Children are known to shed virus for long periods (up to weeks) even after clinical recovery.

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### **SECTION III - DISSEMINATION**

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**RESERVOIR:** Humans, birds.

**ZOONOSIS:** None.

**VECTORS:** None.

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### **SECTION IV - STABILITY AND VIABILITY**

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**DRUG SUSCEPTIBILITY:** No drug has been found to be effective to treat MPV infections or to produce significant benefit.

**SUSCEPTIBILITY TO DISINFECTANTS:** MPV has been shown to be susceptible to ether, chloroform, and a variety of detergents, including 0.1% sodium deoxycholate, sodium dodecyl sulphate, and Triton X-100. It may also be sensitive to hypochlorites (1% sodium hypochlorite), formaldehyde (18.5 g/L; 5% formalin in water), 2% glutaraldehyde, and iodophores (1% iodine).

**PHYSICAL INACTIVATION:** MPV is sensitive to heating above 55 °C for 5 minutes (up to 90% decrease in infectivity). It is also sensitive to freezing and thawing (~90% loss in infectivity following each freeze-thaw cycle). It is also sensitive to acidic media (pH<7).

**SURVIVAL OUTSIDE HOST:** MPV is generally very vulnerable to environmental changes, particularly temperature and humidity. It is sensitive to high and low temperature, and to drying; i.e., low humidity levels. It loses up to 90% infectivity at room temperature after 48 hours and up to 99% at 1 °C after 7

days. The optimal pH is 7.5. It may survive for about 3 to 30 hours on nonporous surfaces at room temperature.

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**SECTION V - FIRST AID / MEDICAL**

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**SURVEILLANCE:** Monitor for symptoms. Other than monitoring for symptoms, there are four main techniques for diagnosing MPV, including virus cultures, serology, immunofluorescence and/or antigen detection, and nucleic acid based tests. Being labor- intensive and time consuming, the first two techniques are rarely employed for diagnostic purposes in epidemiological studies. Rapid diagnostic techniques for viral antigen detection, including immunofluorescent-antibody assay, optical immunoassay, enzyme immunoassay, and chromatographic immunoassay are preferred. Most are commercially available, easy to perform and produce rapid results. Nucleic acid tests (such as RT-PCR) are generally more sensitive.

**Note:** All diagnostic methods are not necessarily available in all countries.

**FIRST AID/TREATMENT:** Treatment is mainly supportive for infants with mild disease; however, children with severe disease, people with underlying illness, and/or immunocompromised individuals may require hospitalization. Another approach is to consider the use of anti-inflammatory drugs; however, their efficacy is yet to be determined.

**IMMUNISATION:** None.

**PROPHYLAXIS:** None.

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**SECTION VI - LABORATORY HAZARDS**

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**LABORATORY-ACQUIRED INFECTIONS:** None reported.

**SOURCES/SPECIMENS:** The main sources for MPV include nasal secretions, nasal swabs, nasopharyngeal swabs, and nasopharyngeal aspirates.

**PRIMARY HAZARDS:** Droplet or aerosol exposure of mucous membranes and accidental inoculation.

**SPECIAL HAZARDS:** None

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## SECTION VII - EXPOSURE CONTROLS / PERSONAL PROTECTION

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**RISK GROUP CLASSIFICATION:** Risk Group 2.

**CONTAINMENT REQUIREMENTS:** Containment Level 2 facilities, equipment, and operational practices for work involving infected or potentially infected materials, animals, or cultures.

**PROTECTIVE CLOTHING:** Lab coat. Gloves when direct skin contact with infected materials or animals is unavoidable. Eye protection must be used where there is a known or potential risk of exposure to splashes.

**OTHER PRECAUTIONS:** All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC). The use of needles, syringes, and other sharp objects should be strictly limited. Additional precautions should be considered with work involving animals or large scale activities.

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## SECTION VIII - HANDLING AND STORAGE

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**SPILLS:** Allow aerosols to settle. While wearing protective clothing, gently cover the spill with absorbent paper towel and apply appropriate disinfectant, starting at perimeter and working towards the centre. Allow sufficient contact time before clean up.

**DISPOSAL:** Decontaminate, either by steam sterilization, incineration, or chemical disinfection, before disposal.

**STORAGE:** The infectious agent should be stored in sealed containers that are appropriately labeled. Storage conditions for MPV can be improved by flash freezing in an alcohol and by addition of stabilizing agents (glycerine or sucrose).

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## SECTION IX - OTHER INFORMATION

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The above information is believed to be accurate but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. ViraTree and its Affiliates shall not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Visit [www.viratree.com/terms](http://www.viratree.com/terms) for complete terms and conditions of sale.