

## EQUINE MORBILLIVIRUS PNEUMONIA

(Since publication of this volume, equine morbillivirus pneumonia has been renamed "Hendra virus disease")

(Acute respiratory syndrome)

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### Definition [top](#)

Equine morbillivirus pneumonia (EMP) is an acute febrile respiratory infection of horses characterized by fever, increased respiratory and heart rates, respiratory distress, and death.

### Etiology [top](#)

The cause of EMP is a newly recognized virus in the genus *Morbillivirus* and was named equine morbillivirus (EMV). When EMV was tested against antisera to a range of paramyxoviruses, morbilliviruses, and pneumoviruses there was a very weak reaction with only rinderpest virus (4).

## History [top](#)

Equine morbillivirus pneumonia has been reported only in Australia. The disease was first recognized on one property in Hendra, Australia, in September 1994. In this outbreak, 20 horses were sick and 13 died, and 2 humans were infected and 1 died (4). A retrospective diagnosis of EMP was made for horses that died in August 1994 on a property in Mackay about 1,100 km from the first reported case of EMP. In this outbreak four horses were infected and two died; the farmer became ill, recovered, had a relapse, and died of EMV infection 13 months later. There was no evidence of epidemiological association between these outbreaks (5,6).

## Host Range [top](#)

Equine morbillivirus has naturally caused disease in horses and humans. Experimentally, cats and guinea pigs have been infected (3). The disease in cats is very similar to the disease in horses (8). The recent detection of neutralizing antibody to EMV in the native Australian fruit-bats suggests a possible reservoir for EMV (10).

## Geographic Distribution [top](#)

Equine morbillivirus pneumonia has been reported only in Australia.

## Transmission [top](#)

On the basis of epidemiologic findings and experimental results with cats, EMV is not readily transmissible. In the field, very few horses in contact with infected horses became ill, and even horses placed in uncleaned stalls previously occupied by an infected horse did not become ill (8). For both animals and humans, EMV seems to require direct contact with respiratory secretions of infected animals (6). If a fruit-bat is the reservoir, the mechanism for spread to the horse is not known.

## Incubation Period [top](#)

The incubation period in horses is 8 to 14 days (2).

## Clinical Signs [top](#)

The initial case of EMP in both outbreaks was a pregnant mare on pasture. Clinical signs in field cases at Hendra were fever up to 105.8° F (41° C), severe

respiratory distress, and death. Two horses that recovered had mild myoclonic twitching (5). In the Mackay outbreak, the pregnant mare had "severe respiratory distress, ataxia, and marked swelling of the head — particularly of the infraorbital fossa and cheeks. The second horse, a stallion (horse B), reportedly showed aimless pacing, muscle trembling and a haemorrhagic nasal discharge" and died (5).

In experimentally infected horses, the first sign of disease was fever that ranged from 102.2 to 106° F (39 to 41.2° C). In some animals, as the disease progressed, heart and respiratory rates increased up to 72 and 60 per minute, respectively, breathing became labored, and the animal's demeanor varied from somnolence to mild agitation (2).

### **Gross Lesions** [top](#)

The most distinctive gross lesion in EMP is a bilateral "pulmonary edema characterized by gelatinous distention of subpleural lymphatics." The lungs are heavy and congested; the edema is more prominent in the ventral parts and the lungs vary from a mottled yellowish-brown to dark blue. The major air passages are essentially normal. In one experimental horse, there was also a bilateral dilation of the pulmonary lymphatics and a very enlarged dark spleen (2).

### **Morbidity and Mortality** [top](#)

The number of animals that have been infected naturally and experimentally is small, but using these numbers, mortality is high in animals infected. Owing to the low transmissibility of EMV, morbidity has been low.

### **Diagnosis** [top](#)

#### **Field Diagnosis** [top](#)

Equine morbillivirus pneumonia should be suspected when a horse that dies has been febrile and the necropsy findings include a pulmonary edema characterized by gelatinous distention of subpleural lymphatics.

### **Specimens for the Laboratory** [top](#)

Specimens sent to the laboratory for culture should consist of pieces of lung, liver, spleen, kidney, lymph nodes, brain, and heparinized blood. For serology, serum samples from acute and convalescent animals should be submitted. For

histopathologic examination, send a complete set of tissues in 10 percent formalin.

### **Laboratory Diagnosis** [top](#)

To confirm a suspected diagnosis of EMP, the virus has to be isolated and identified. The disease can tentatively be diagnosed by histopathology as well as histochemical and molecular biological techniques.

### **Differential Diagnosis** [top](#)

Because of the pulmonary edema, African horse sickness is a primary consideration in a differential diagnosis.

Other causes of acute death are poisons, intoxications (botulism), and acute bacterial diseases such as anthrax.

### **Treatment** [top](#)

There is no treatment for the primary disease.

### **Vaccination** [top](#)

There is no vaccine.

### **Control and Eradication** [top](#)

In Australia, disease control and eradication procedures consisted of slaughter of known infected horses and extensive serological surveillance. No antibody to EMV was detected in sera from 98 horses remaining on the Hendra property, in sera from horses on adjacent properties, nor in sera from horses on trace-back and trace-forward properties. No EMV antibody was detected in sera collected from the Queensland population of nonracing horses selected using a stratified proportional approach (7).

### **Public Health** [top](#)

If one considers that there have been three human infections and two human deaths in only two outbreaks of this disease, maximum precautions should be used if this disease is suspected. The three individuals infected had extensive contact with the infected horses and "assisted in their necropsies without gloves,

mask, or protective eyeware"(6). It should be noted, however, that others also had contact with the animals and conducted or participated in necropsies and did not get infected; thus it is suspected that "direct contact with respiratory secretions of infected animals seems to be necessary for transmission"(6).

## **GUIDE TO THE LITERATURE** [top](#)

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