



Equine Protozoal Myeloencephalitis (EPM)

Disease Name: Equine Protozoal Myeloencephalitis (EPM)

Disease Type: EPM is a protozoal infection of the central nervous system caused by *Sarcocystis neurona* in most cases. *Neospora hughesi* can also cause disease.

Transmission: The opossum (*Didelphis virginiana* in North America and *D. albiventris* in South America) is the definitive host for *S. neurona*. Sporocysts are excreted in opossum's feces and then consumed by an intermediate host. In the horse, which is an incidental-dead end host, the sporocysts are consumed in food or water contaminated by opossum feces. From the intestine the organism can migrate to the central nervous system where it can cause injury. *S. neurona* sporocysts excreted by opossums can persist in the environment.

Frequency and risk factors: Uncommon. More than 50 percent of all horses in the United States may have been exposed to the organism that causes EPM. All horses are considered susceptible to EPM, but most horses exposed to the causative organisms never show signs of disease. Young age (1-5 years old), old age (>13 years), breed (Thoroughbred, Standardbred, and Quarter Horse), and season (spring, summer, fall) have all been identified as risk factors in some studies. Stressful events such as heavy exercise, transport, injury, surgery, and parturition are also thought to increase risk.

Incubation period: Time from ingestion of sporocysts to the onset of disease is unknown.

Carrier status: Because the horse is a dead end host there is no transmission between horses.

Severity: Neurologic signs can vary from mild to severe.

Clinical signs and symptoms: Clinical signs are variable and can mimic most other neurologic diseases as well as musculoskeletal problems. This variability occurs because the parasite can affect all part of the central nervous system (CNS).

Clinical signs reflect affected areas of the spinal cord and brain and can include the following:

- ataxia (asymmetric)
- weakness
- muscle atrophy
- unusual or atypical lameness
- reduced or absent sensation,
- alterations in level of consciousness or behavior
- cranial nerve deficits such as problems eating, facial paralysis and abnormal eye movements.

EPM is often progressive but can have an acute or insidious onset. The progression can be rapid, or the clinical signs might appear to stabilize only to relapse or worsen later.

Diagnosis: The diagnosis is made by 1) having a veterinarian confirm that the clinical signs consistent with

spinal cord or brain dysfunction through careful clinical neurologic examination, (2) exclusion of other potential causes of these signs using appropriate diagnostic testing, and (3) immunodiagnostic (serologic) testing on paired serum and cerebral spinal fluid samples to confirm antibody production against *S. neurona* or *N. hughesi*. A positive serum test indicates exposure to the organism but does not confirm CNS infection, regardless of the magnitude of the titer. A negative serum test usually indicates that the horse has not been exposed to the organism. Although a positive CSF test is more likely to correlate with an EPM diagnosis than a positive serum test false positives commonly occur.

Treatment: Treatment of horse with clinical signs includes administration of anti-protozoal drugs such as ponazuril and diclazuril. Consult with your veterinarian for detail information and treatment options. The sooner treatment is initiated; the better the horse's chances are for recovery.

Prognosis: Sixty to 70 percent of EPM cases aggressively treated show significant or complete reversal of symptoms. Many horses are able to return to normal activity. Approximately 10 to 20 percent of horses may experience a relapse.

Prevention: Horses with EPM are not contagious and do not pose a risk to neighboring horses. Disinfection is not necessary for areas or objects in contact with affected horses. Minimizing contact with opossum feces will help prevent EPM. Prophylactic administration of anti-protozoal drugs may also be considered for horses at high risk and should be prescribed by a veterinarian.

Biosecurity: Eliminating access of opossums to feed and water is recommended by keeping grains in rodent-proof containers and forages in enclosed facilities.