NEW ENGLAND EQUINE
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EEE (Eastern Equine Encephalomyelitis)

Eastern Equine Encephalomyelitis (EEE) is one of three in a group of viral diseases causing inflammation of the brain and spinal cord in horses and people (as well as several other mammal species). The other two diseases in this group are Western Equine Encephalomyelitis (WEE) and Venezuelan Equine Encephalomyelitis (VEE). All three strains have been recognized in the Western hemisphere and exist in both temperate and desert climates. As the name suggests, WEE is more commonly recognized in the Western states while EEE is primarily found in the Southeastern states but has been recognized in all states east of the Mississippi. It was first recognized in Massachusetts in 1831.

Mosquitoes are responsible for transmitting EEE to horses. Mosquitoes ingest the virus after biting an infected wild animal (most commonly a bird) and can then transmit the disease to horses. The virus is not very contagious from horse to horse. The virus is rarely in high enough concentrations in infected horses to be transmitted by mosquitoes to another horse or to humans. Very rarely, the disease can be spread through nasal secretions (this is more common for VEE than EEE). The risk of EEE tends to fluctuate with the mosquito population, with more cases seen when mosquito populations are large.

Mosquitoes inoculate the virus into a horse and the virus then multiplies in the muscle and travels throughout the body. The central nervous system (including the brain and spinal cord) usually becomes infected in 3-5 days, with symptoms developing shortly thereafter. Initial clinical signs include depression, fever, anorexia and generalized stiffness. Compared to WEE, horses with EEE tend to develop worse neurologic signs. At this point the fever may go up and down sporadically while clinical signs move from a state of depression to propulsive walking, excitability, increased sensitivity to stimuli, and aggression. Horses may present with head pressing, circling, blindness and muscle fasciculations (twitches or trembling). Paralysis of the tongue, pharynx and larynx is common. Animals eventually are no longer able to stand and can become unresponsive. Horses generally do not survive once they reach this point. Mortality rates are quite high for this group of diseases with EEE causing death in 75% of infected horses (WEE causes 20-50% mortality, VEE a 40-80% mortality rate). Those that do survive EEE often have prolonged or permanent neurologic deficits and recovery takes weeks to months.

Unfortunately, no cure exists for EEE and treatment is aimed at supportive therapy to control inflammation, convulsions and secondary bacterial infections. Protection from self-trauma is also paramount when these horses begin to display more severe neurologic signs. Based on clinical signs alone, EEE is very difficult to differentiate from other neurologic conditions including West Nile Virus, so laboratory testing is required for an accurate diagnosis.

Prevention is the best way to control EEE for both horses and humans. Do your best to reduce the mosquito population on your property by limiting standing water where possible, using insecticides and window screens, and vaccinate your horses. Vaccination is very effective in horses and has been shown to provide adequate protection for 6-8 months. Be sure to time vaccination with the mosquito season in your region. Horses should be vaccinated before the mosquito season has begun to ensure they are well protected before they are at risk of exposure. In years when a particularly high number of EEE cases have been reported, veterinarians may recommend vaccine boosters in the late summer or early fall in addition to the annual spring vaccination. By early September of this year cases of EEE were confirmed in Maine, Massachusetts, New Hampshire, Connecticut and New York State and new cases were still being reported in mid to late October. To the authors' knowledge, no cases have been reported in horses that had a complete EEE vaccination history. Always consult with your veterinarian to ensure proper vaccination timing and administration and to get up-to-date information on the EEE threat in your area.

Reference:
Reed S., Bayly W., Sellon D., In: Equine Internal Medicine. 3rd ed. St. Louis: Elsevier; 2010. pps. 624-628.