EASTERN EQUINE ENCEPHALITIS

Eastern equine encephalitis (EEE) is an arthropod-borne viral disease caused by an Alphavirus (Family Togaviridae). This virus is circulated in nature via migratory birds along the entire Atlantic seaboard from Canada to south Florida, as well as in the north-central states. EEE virus is passed among birds by mosquitoes..predominantly *Culiseta melanura,* a fresh water swamp mosquito; a number of so-called "bridge vector" mosquito species (most frequently *Coquillettidia perturbans, Ochlerotatus* species, and *Aedes* species) serve as vehicles for transmission of the virus from birds to humans, horses, and other animals. Humans and horses are considered dead-end hosts for EEE, in that amplification and further spread does not typically occur.

Carriage of EEE by birds occurs in the eastern US throughout the warm months of the year. Unusually wet spring weather and large mid-summer to fall hatches of bridge vector mosquitoes usually precede outbreaks of EEE. Thus, most cases of equine and human EEE are acquired within 5 or 6 miles (the flight range of bridge vector mosquitoes) of cypress or hardwood swamps.

Human EEE is relatively uncommon; however, a few cases are seen every year in eastern states. Although 2 infections occurred in North Carolina last year (one each in Scotland [fatal] and Camden [non-fatal] counties), only 153 confirmed human cases of this disease nationwide have been reported to CDC since 1964. In contrast, EEE is recognized more frequently in equines; last year 17 horses and 1 mule were diagnosed in North Carolina.

The course of infection with EEE in humans depends upon the age of the patient and the presence or absence of central nervous system (CNS) involvement. Those individuals sustaining CNS infection almost always fare poorly. During epidemics, acute mortality may approach 70%, and most survivors of CNS infection are left with serious neurologic sequellae. The age groups most susceptible to severe illness are children and adults >55 years of age. The apparent: inapparent disease ratio in a single study following a 1959 New Jersey outbreak was reported to be 1:23; however, this number may be somewhat inflated.

All residents and visitors to areas where EEE activity is occurring are at some risk of acquiring the infection. Highest risk groups include individuals engaged in outdoor work and recreational activities, particularly within several miles of swampy mosquito breeding areas, and particularly at or near twilight.

State- and Federal- supported surveillance for EEE (and other arboviral diseases) includes monitoring of sentinel chicken flocks for arboviral activity, periodic sampling of mosquitoes, and sampling of migratory birds. Critical complementary activities include reporting and laboratory evaluation of veterinary (predominantly equine) encephalitis cases by local horse owners and veterinarians, and reporting and diagnostic evaluation of human encephalitis/meningitis by health care providers.

LHD control measures for EEE should incorporate the following: education of health care providers and the public about EEE; encouraging use of repellants (particularly those containing DEET) when engaged in outdoor activities; avoidance of outdoor activities during peak mosquito biting hours (from one hour before to one hour after dusk and dawn); wearing long pants, shoes, socks, and long-sleeved shirts if outdoors around twilight; and removal/weekly refreshing of standing water sources (eg, barrels, tires, old cans, wading pools, pet watering dishes, bird baths, ditches) that may serve as mosquito breeding sites. Although there is no licensed EEE vaccine for human use, an effective equine vaccine is available, and horse owners should be encouraged to use it. Vigilance for, and prompt reporting of, all cases of encephalitis and meningitis among humans and horses are particularly critical, and must be encouraged. Targeted mosquito control activities should be considered based upon surveillance findings.