

Technical Questions and Answers for Veterinarians and Other Animal Care Professionals: Zika virus and nonhuman primates (NHPs)

Q: Can NHPs become infected with Zika virus?

A: Limited evidence suggests that NHPs can become infected with Zika virus. In the late 1940's sentinel monkeys were placed on platforms in the Zika Forest to help identify the vector involved in the non-human cycle of yellow fever. The temperatures of these sentinel monkeys were taken daily. Blood samples were taken from any monkey showing a rise in temperature above what was considered normal and these samples were inoculated into mice and monkeys. In 1947, Zika virus was first isolated from one of these sentinel monkeys in the Zika forest. In the 1950s, monkeys were infected by subcutaneous or intracerebral inoculation with mouse brain adapted Zika virus. No signs of infection were noted in the group inoculated subcutaneously, but 1 animal in the intracerebrally infected group had a slight elevation in temperature on days 1–4 after inoculation. All monkeys inoculated by both routes developed neutralizing antibodies by day 14 after inoculation. (1)

Q: Do monkeys infected with Zika virus become ill?

A: Not much is known about Zika virus infections in NHPs. The one sentinel monkey from which Zika was first isolated had a slightly elevated temperature. In one research study, no physical signs or elevated temperature was observed in rhesus monkeys inoculated subcutaneously with mouse brain–adapted virus. (1, 2)

Q: What is the incubation period for Zika virus in NHPs?

A: In one study, all monkeys inoculated subcutaneously with mouse brain–adapted virus had circulating virus from 4–5 days after inoculation. One other monkey had virus in the blood on days 8–9 following inoculation with virus from a pool of infected mosquitoes (1).

Q: What is the risk of importing NHPs that are infected with Zika virus and subsequently infecting local mosquito populations with Zika virus?

A: Nonhuman primates can only be imported into the United States for science, education or exhibition and cannot, under any circumstances, be imported as pets. The prevalence of Zika virus in monkey populations is not known. Imported NHPs undergo a 31-day quarantine after importation. This quarantine is done in an enclosed building or in a screened enclosure that keeps the vector away from the animals. People working with the imported NHPs must wear personal protective equipment (PPE) that includes coveralls, eye protection, and respiratory protection. Based on limited research, any animal that entered quarantine with a Zika virus infection or any animal incubating a Zika virus infection should have neutralizing antibodies to the virus at the end of the quarantine period. Therefore, there should be no risk of infecting local mosquito populations from imported NHPs.

Q: What is the risk of Zika virus infections in NHP colonies housed in outdoor facilities?

A: If Zika virus is found in humans in areas that have outdoor NHP housing, the animals could be infected with the virus. Facilities with outdoor housing should work with state and local

authorities to develop a mosquito surveillance and management program at the facility to prevent the spread of Zika virus.

References:

1. Dick, G.W.A., [Zika Virus \(II\): Pathogenicity and Physical Properties](#), Transactions of the Royal Society of Tropical Hygiene and Medicine, 46 (5): 1952.
2. Winebren, MP and Williams, MC, Zika Virus: [Further Isolations in the Zika Area and Some Studies on the Strains Isolated](#), Transactions of the Royal Society of Tropical Hygiene and Medicine, 52(3): 1958.
3. Hayes, EB, [Zika Virus Outside Africa](#), *Emerging Infectious Disease*, 15(9): 2009.