



Cornell University  
Animal Health Diagnostic Center

PO Box 5786  
Ithaca, NY 14852-5786  
t. 607 253-3900  
f. 607 253-3943

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## Canine Influenza Virus

Influenza virus was first identified as an infectious disease of dogs in 2004. The first isolation of the virus was done at the Animal Health Diagnostic Center at Cornell in conjunction with a study being conducted by the University of Florida on respiratory disease in racing greyhounds. The virus was sequenced at the CDC and determined to be related to the H3N8 equine virus that was circulating in horses in the US. Specific genetic differences between the equine viruses and the virus from canines defined the virus as a unique canine influenza virus (CIV). Within a year of the discovery, CIV was found in pet dogs in Florida and in the New York City area. Since that time the virus has been found in different areas of the US but in most cases, the infection was contained and did not become enzootic. The exceptions to this pattern were Florida, New York City area, and Colorado.

Currently, there is an increase in awareness of CIV due to the release of a CIV vaccine, the detection of the virus in several new areas and more testing in support of the vaccine release. The Northeast region (New York City to Philadelphia) continues to see CIV activity with a new introduction into northern Virginia. Colorado also continues to have frequent CIV activity with new reports from Las Vegas and California (California has had positive dogs in the past). Virus has not been detected in Florida over the past year.

CIV continues to move slowly through the canine population. Risk factors for the infection are having dogs in closely confined conditions such as in boarding kennels, day care settings and animal rescue shelters. Animals being relocated from the rescue shelters seem to be a main source of the movement of the virus to new locations. The clinical signs associated with the infection are indistinguishable from the traditionally defined "kennel cough" now more appropriately referred to as acute respiratory disease in dogs. The morbidity rate in normal populations can be very high (60-80%) while the mortality rate due exclusively to CIV is very low. The significance of a CIV infection is that it comprises the normal defense mechanisms of the canine respiratory tract so that secondary bacterial infections are common sequelae. Dogs may cough for several weeks after infection, but they are not contagious at this time. Dogs are generally free of CIV by 7 days post onset of clinical signs.

The vaccine should be considered in those situations where one would have used the standard kennel cough vaccines and where there have been documented cases of canine influenza. Simply having a seropositive dog in a given area is not definitive proof of the existence of CIV unless one has proof that the dog originated in that area and never traveled to an area enzootic for CIV. Those involved in the breed rescue organizations should not be moving dogs from affected areas without vaccinating the animals that will be coming in contact with the rescued animal. It should be noted that the approved vaccine is a killed product that requires two doses of vaccine three weeks apart to achieve maximum protection.

The question of survival on/in the environment is always complicated by the exact conditions of the environment. Virus on a solid surface at 70F in the sunlight is dead within a few minutes. Virus in a cool, moist, and dark environment may survive for several days and at 4C it might be weeks. If one has cleaning procedures that take care of parvovirus, then there will be no influenza surviving. Transmission through fomites (saliva on hands or clothing) is certainly a possibility. It may be a major route of transmission in the shelters where workers go from one cage to another without changing gloves if they have them. Common sense would dictate that if one is around a dog that has clinical signs of a respiratory infection, then at a minimum one should go through the hand washing recommendations suggested to prevent spread of H1N1.

The diagnosis of canine influenza necessitates the identification of CIV in the acutely infected animal or demonstrating CIV antibodies in the later stages of the clinical event. As noted earlier, CIV infections cannot be diagnosed by clinical signs. Detection of CIV can be done by doing a PCR test for influenza virus or by isolating CIV from a clinical sample. The AHDC offers a PCR test that can detect any influenza virus in a specimen, not just CIV. We offer this test as other influenza viruses are capable of infecting dogs and it would be unfortunate to miss a new strain of influenza in dogs if one were only doing an H3 CIV PCR. Samples for PCR testing should be taken within 4 days of onset of clinical signs and the sample of choice is a nasal swab. Swabs should be placed into a tube with several drops of saline. **DO NOT USE A BACTERIAL TRANSPORT MEDIUM FOR PCR TESTING OR FOR VIRUS ISOLATION.** Swabs should be refrigerated and sent overnight on ice packs. For antibody testing, an acute and convalescent sample (10-14days apart) is optimal, but in areas of low CIV prevalence, a single sample taken >7 days after acute onset may be sufficient.

Questions regarding CIV can be directed to Dr. Edward J. Dubovi, Director-Virology Section.

This version was provided to the AKC Delegate's Canine Health Committee by Dr. Dubovi, and may be reproduced for distribution.