



What is canine influenza?

Canine influenza is a highly contagious respiratory disease of dogs caused by novel strains of the influenza A virus. Two strains of canine influenza virus have been identified in the United States: H3N8 and H3N2.

The H3N8 virus strain was first identified in racing greyhounds in Florida in 2004, and has since been detected in dogs in most states. It is thought this strain developed from an equine H3N8 influenza strain.

The H3N2 virus strain was diagnosed as the cause of the ongoing canine influenza outbreak, which began in early 2015 in the Chicago area and other parts of the Midwest and has subsequently spread to a number of states. Prior to this, H3N2 canine influenza had been identified in dogs in South Korea, China, and Thailand in 2006-2007, and likely arose from an avian influenza virus.

What are the clinical signs of canine influenza infection?

Canine influenza causes an acute respiratory infection in dogs. Clinical signs include coughing, sneezing, nasal and/or ocular discharge, lethargy, anorexia, and fever. Damage to the epithelial cells lining the respiratory tract (from the nasal lining to the terminal airways) predisposes to secondary bacterial infections that further contribute to nasal discharge and coughing. Infections can occur at any time of the year. Although very uncommon, this virus can be fatal in some dogs.

Can canine influenza virus infect other species?

There have been no known cases of canine influenza virus (H3N8 or H3N2) infecting humans. In early 2016, a group of shelter cats in Indiana was diagnosed with H3N2 canine influenza. It is believed the virus was transmitted to the cats from infected dogs in the same shelter.

Is canine influenza a reportable disease in Minnesota?

At the request of veterinarians and the public, the Minnesota Board of Animal Health placed canine influenza back on its official list of reportable diseases in July 2017.

What tests are offered at the VDL?

The Influenza Virus Matrix PCR test will detect any influenza variant that may infect dogs (or other species). Further characterization as the H3N8 or H3N2 virus strains can potentially be requested on positive samples.

- Nasal or pharyngeal swabs are the sample of choice for detecting virus in acutely infected dogs.
 - The preferred swabs to use are synthetic (Dacron or Rayon) on plastic shafts.
 - Be careful to avoid any agar gel-type media (e.g., bacterial transport media). Swabs can be placed in a sterile red-top blood collection tube with a few drops of sterile saline (or viral transport media, if available) to prevent desiccation.
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- Samples should be shipped chilled on frozen gel packs using next-day delivery.
- After 4-7 days of clinical signs, virus shedding significantly decreases and may not be detectable by PCR. Positive PCR results are most likely correct, but negative results may be “falsely negative” if collected in later stages of illness.
- If an animal dies from a suspected influenza infection, the sample of choice for PCR is fresh lung tissue.

The Canine Influenza Hemagglutination Inhibition test (HI) detects serum antibodies to the H3N8 or H3N2 virus. Antibodies to canine influenza develop rapidly, often with a significant antibody titer by 10 days post infection. Serologic assays can be useful in confirming canine influenza infection, especially in cases where the PCR test is negative but the index of suspicion is high.

- For the diagnosis of recent active infection, paired acute and convalescent serum samples should be submitted.
- Specify whether the sample is to be tested for H3N8- or H3N2-specific antibodies.
- Serum samples (at least 1 mL serum per test) should be shipped chilled on frozen gel packs using next-day delivery.
- In animals that were previously administered canine influenza vaccines, detectable antibodies to the virus in the administered vaccine (H3N8 or H3N2) are expected. It is important to include vaccination history when requesting HI testing.

What are the fees associated with testing? (per the 2017 fee schedule)

- A \$10.00 accession fee will be applied to all submissions.
- Molecular Diagnostics (<https://www.vdl.umn.edu/services-fees/molecular-diagnostics/viral-pcr>)
 - Canine Influenza Virus – Group A Matrix RRT-PCR = \$15.00
 - Canine Influenza Virus – Subtyping for H & N = \$34.00 (sent to reference lab, fee includes shipping)
- Serology (<https://www.vdl.umn.edu/services-fees/serology/canine>)
 - Canine Influenza Virus – CIV Hemagglutination Inhibition = \$10.50

Additional resources:

- Minnesota Board of Animal Health List of Reportable Diseases (<https://www.bah.state.mn.us/reportable-diseases/>)
- AVMA Reference Guide on Canine Influenza (<https://www.avma.org/KB/Resources/Reference/Pages/Canine-Influenza-Backgrounder.aspx>)
- Cornell University College of Veterinary Medicine Canine Influenza H3N2 Updates (<https://ahdc.vet.cornell.edu/news/civchicago.cfm>)