

## **Influenza A virus in Dogs**

Hana Van Campen, DVM, PhD, ACVM

Colorado State University-Veterinary Diagnostic Laboratories

In March 2004, influenza A virus was isolated by Dr. Ed Dubovi, Cornell University, from a sample of lung obtained from a racing greyhound. The influenza A virus was associated with an outbreak of severe respiratory disease which occurred earlier in the year in Florida. Dogs exhibited coughing, fever ( $\geq 39^{\circ}\text{C}$ ) and, in some cases, hemorrhage and bronchopneumonia. The influenza A virus was most similar to recent isolates of equine influenza A viruses of the H3N8 subtype. Retrospective study traced the influenza A virus infection in dogs to 2000. Evidence has also been found for the spread of the infection in pet dogs and in dogs in shelters.

1. **Clinical presentation:** The majority of dogs infected with influenza A virus infections are reported as being ill. Two disease entities have been recognized, a “kennel cough”-like disease and a severe, hemorrhagic pneumonia in racing greyhounds.
2. **Differential diagnoses:** Currently in Colorado, canine distemper virus and *Bordetella bronchiseptica* infections should be considered. Other less common agents of respiratory disease in dogs include canine adenovirus 1 & 2, and parainfluenza virus-2.
3. **Diagnostic tests:** The following diagnostic tests for canine influenza are offered at CSU-VDL, Ft. Collins:
  - a. Virology: To demonstrate the presence of influenza A virus in the acute (first 5 to 7 days after infection):
    - i. Influenza A PCR (test # 788): Detects viral RNA in the acute phase of infection. The PCR test is a very sensitive and specific test; however, viral RNA is easily degraded if improperly handled.
      1. Sample: nasal or pharyngeal swab, transtracheal wash, lung
      2. Submission instructions: send overnight, on icepack,
      3. Turn around time: 1 week
      4. Cost: \$30.00
    - ii. Influenza A ELISA (test # 730): Detects the influenza A viral antigens in the acute phase of infection. The ELISA is less sensitive than PCR; however, viral proteins are more stable than RNA.
      1. Sample: nasal or pharyngeal swab, transtracheal wash, lung
      2. Submission instructions: send overnight, on icepack
      3. Turn around time: run same day as received
      4. Cost: \$20.00
    - iii. Virus isolation (companion animal) (test # 713): Detects infectious influenza A virus which is present in greatest amounts in the first 3 to 5 days after infection. Influenza A viruses are easily inactivated by soap, disinfectants, heat and UV light; therefore, careful handling is required to preserve viral infectivity.
      1. pharyngeal swab, transtracheal wash, lung
      2. Submission instructions: send overnight, on icepack
      3. Turn around time: 1 to 3 weeks.

4. Cost: \$40.00

**b.** **Serology:** To demonstrate the presence of antibodies to equine influenza A2 virus of the H3N8 subtype in the serum of dogs. Any positive tests indicate past exposure to and infection with influenza A virus of the H3 subtype assuming that the dogs have not been previously vaccinated with a product for horses.

**i.** Submit for Influenza A hemagglutination inhibition (equine influenza A2 HI) (test # 841).

1. Sample: Acute and convalescent (obtained 2 weeks later) serum samples in red-topped tubes.

2. Submission instructions: send overnight

3. Turn around time: HI tests are set up on Wed. and Fri. and are reported out the next day.

4. Cost: \$7.50