

American Veterinary Medical Association Report

Canine Influenza

Causative agent

Canine influenza (CI), or dog flu, is a highly contagious infection caused by an influenza A virus. The causative canine influenza virus (CIV) strains have been classified as H3N8 and H3N2, based on the amino acid composition of the hemagglutinin (H) and neuraminidase (N) glycoproteins in the lipid outer layer of the capsid. These glycoproteins facilitate entry into and release from host cells, and are important targets for antibodies against the virus (generated as a result of infection or response to vaccination). The viruses are 80-120 nanometers (nm) in diameter, and consist of a core of eight separate pieces of single-strand ribonucleic acid (RNA) surrounded by a spiked arrangement of glycoproteins.

H3N2 canine influenza appeared limited to Korea, China and Thailand until March 2015, when an outbreak that started in the Chicago area was determined to be due to an H3N2 strain. The H3N8 canine influenza virus represents a very rare event in adaptive evolution; the entire genome of the H3N8 equine influenza virus was transferred to dogs, and the virus adapted to the canine species to emerge as a new canine-specific virus. The canine H3N2 strain, on the other hand, emerged in Asia in 2006-2007 among dogs suffering from respiratory disease. This strain in Asia likely arose through the direct transfer of an avian influenza virus – possibly from among viruses circulating in live bird markets – to dogs. The new canine virus spread widely among dogs in South Korea and in several regions of China, and caused an outbreak of respiratory disease among dogs in Thailand in 2012. In 2015, a canine H3N2 that was genetically almost identical (99% identical) to the Asian strain was detected in the United States. Although rumors have circulated that the virus was introduced to the U.S. through dogs rescued and imported from Asia, there is no evidence to confirm these rumors.

Canine influenza is a reportable disease in some U.S. states.

In March 2016, the University of Wisconsin School of Veterinary Medicine and the Wisconsin Veterinary Diagnostic Laboratory announced that the H3N2 strain had infected a group of cats in the Midwest. Additionally, they reported that their findings suggested that the virus was replicating in cats and could spread from cat to cat.

Natural distribution

The **first recognized outbreak of H3N8 canine influenza** occurred in racing greyhounds in January 2004 at a track in Florida. From June to August of 2004, outbreaks of respiratory disease were reported at 14 tracks in 6 states (Florida, Texas, Alabama, Arkansas, West Virginia, and Kansas). Between January and May of 2005, outbreaks occurred at 20 tracks in 11 states (Florida, Texas, Arkansas, Arizona, West Virginia, Kansas, Iowa, Colorado, Rhode Island, and Massachusetts). Since then, the H3N8 canine influenza has been documented in 40 states and Washington, DC. The H3N8 strain of canine influenza virus is endemic in areas of Colorado, Florida, New York, and Pennsylvania.

The **first recognized U.S. outbreak of H3N2 canine influenza** occurred in 2015, starting in Chicago and spreading to other Midwestern states. Since March 2015, outbreaks have occurred in a number of areas throughout the U.S. and thousands of dogs have been confirmed positive for the H3N2 virus. Outbreaks are more commonly seen in situations where groups of susceptible dogs are in close contact, such as shelters, kennels, dog day care facilities, and grooming or boarding facilities. In March 2016, it

was reported that cats in an Indiana shelter had been infected with the virus, spread from dogs, and that cat-to-cat transmission could occur.

Transmission

Canine influenza is spread via aerosolized respiratory secretions (via coughing, barking and sneezing) and contaminated objects (kennel surfaces, food and water bowls, collars and leashes) and people moving between infected and uninfected dogs. The virus can remain viable (alive and able to infect) on surfaces for up to 48 hours, on clothing for 24 hours, and on hands for 12 hours.

The incubation period is usually two to four days from exposure to onset of clinical signs. The highest amounts of viral shedding occur during this time; therefore, dogs are most contagious during this 2-4 day incubation period when they are not exhibiting signs of illness. Virus shedding decreases dramatically during the first 4 days of illness but may continue up to 7 days in most dogs and up to 10 days in some dogs with H3N8 canine influenza. Intermittent H3N2 shedding for up to 26 days can occur; therefore, dogs infected with H3N2 should be isolated for at least 21 days.

Accessed 5-25-2017

<https://www.avma.org/KB/Resources/Reference/Pages/Canine-Influenza-Backgrounder.aspx>