

DOH Florida Veterinarian Influenza Information

Introduction

As the veterinarian is the only health care professional likely to see both people and their animals, they must have an awareness of the potential threat of zoonotic diseases. With the recent spread of novel H1N1 Influenza (Swine Flu) and the H5N1 Highly Pathogenic Avian Influenza, this responsibility has never been more important.

This article was prepared for Florida's veterinarians to provide current information about influenza viruses that they may encounter, or may be asked questions about in their practice.

Influenza Virus

Influenza, commonly referred to as the flu, is an infectious disease caused by RNA viruses of the family Orthomyxoviridae, which affects birds and mammals. Influenzas are broadly divided into three types: A, B, and C. Influenza A viruses are found in many different animals and influenza B viruses circulate widely only in humans. Influenza C viruses are known to infect humans and swine, but are rarely encountered when compared to types A or B.

Influenza A viruses are divided into subtypes based on two proteins on the surface of the virus: the hemagglutinin (H) and the neuraminidase (N). There are 16 different hemagglutinin subtypes and 9 different neuraminidase subtypes, all of which have been found among influenza A viruses in wild birds. Wild birds are the primary natural reservoir for all subtypes of influenza A viruses and are thought to be the source of influenza A viruses in all other animals.

Typically, influenza is transmitted through the air by droplets containing the virus. Influenza can also be transmitted by bird droppings, saliva, nasal secretions, feces and blood. Infection can also occur through contact with these body fluids or through contact with contaminated surfaces.

The influenza virus is easily killed by disinfectants commonly used in veterinary facilities, such as quaternary ammonium compounds and bleach solutions. Animals showing signs of influenza infection should be isolated. Clothing, equipment, surfaces and hands should be cleaned and disinfected after exposure to these animals.

Canine Influenza

The first recognized outbreak of canine influenza is believed to have occurred in racing greyhounds in January 2004 at a track in Florida. The canine influenza virus is closely related to the virus that causes equine influenza and it is thought that the equine influenza virus mutated to produce the canine influenza virus.

Canine influenza virus causes clinical disease that mimics kennel cough. As a result, infection with the virus is frequently mistaken for infections caused by the *Bordetella*

bronchiseptica/ parainfluenza virus complex. Two clinical syndromes have been reported—a mild form of the disease and a more severe form that is accompanied by pneumonia. Fatal cases of pneumonia resulting from infection with canine influenza virus have been reported in dogs, but the fatality rate (5% to 8%) has been low.

There is no evidence of transmission of canine influenza virus from dogs to humans or other animal species.

A canine influenza H3N8 vaccine manufactured by Intervet/Schering Plough received conditional approval from the USDA in May. The vaccine has been available to veterinarians since June. While this vaccine does not induce sterilizing immunity, it does significantly reduce virus replication and associated pathology in the lungs, the severity and duration of clinical disease, and the amount and duration of virus shedding. This means that vaccinated dogs that become infected are less likely to have severe symptoms and are not as contagious to other dogs.

The kennel cough (*Bordetella bronchiseptica* /canine parainfluenza complex) vaccine does not provide protection against canine influenza.

Equine Influenza

Equine influenza affects horses, donkeys, mules, and other equidae. The virus is widespread with only Iceland, New Zealand, and Australia considered to be free of the virus.

Equine influenza virus causes clinical disease of the upper respiratory tract. The virus spreads rapidly, and naïve or immunocompromised horses are at higher risk of developing disease. Colic and edema of the legs and scrotum have also been observed with influenza infection. In the absence of secondary complications, healthy, adult horses usually recover within one to two weeks; however, coughing may persist for a longer period. Young foals lacking adequate maternal antibodies are at risk of developing a rapidly fatal viral pneumonia.

There is evidence that equine influenza can be transmitted to humans, but this occurrence is rare.

Inactivated intramuscular and intranasal vaccines are commercially available for prevention of influenza in equids.

Avian Influenza

Avian influenza has appeared periodically in regions all over the world, including the United States. The virus spreads easily among wild birds, which are the natural hosts of avian influenza viruses, but certain strains can also infect domesticated birds.

Avian influenza is broadly divided into highly pathogenic (HPAI) and low pathogenic (LPAI) strains based on its ability to cause disease in poultry. Low pathogenic avian influenza is a natural infection of waterfowl that may cause few, if any, signs of disease

in domestic poultry and wild birds. Highly pathogenic avian influenza is rarely found in waterfowl, but causes severe disease in domestic poultry with a high case fatality rate.

Clinical signs include diarrhea, sneezing, gasping for air, nasal discharge, coughing, lack of energy and appetite, swelling of tissues around eyes and in neck, purple discoloration of wattles, combs, and legs, depression, muscular tremors, drooping wings, twisting of head and neck, incoordination, complete paralysis and sudden death.

Avian influenza is found in secretions from the nares, mouth, and eyes of infected birds and is also excreted in their feces. It is most often spread by direct contact between infected and healthy birds. It may also be spread indirectly through contact with contaminated equipment, materials or feces.

The risk of contracting avian flu is not particularly high for pet birds in the United States. Pet birds should not be allowed to interact or have contact with wild birds or their feces.

Some strains of avian influenza have infected humans and a variety of other mammals.

Avian influenza vaccines are available and used primarily in commercial flocks.

H5N1 Highly Pathogenic Avian Influenza (Asian strain)

H5N1 Highly Pathogenic Avian Influenza (H5N1 HPAI) has infected birds in Asia, Europe, and Africa since the end of 2003. This particular form of avian influenza is deadly to most domestic poultry and some wild birds, and can spread rapidly in flocks.

To date, H5N1 HPAI has not been found in birds in North America, including the United States. However, if H5N1 HPAI is identified in North America, everyone, including veterinarians and pet owners, should be aware of the potential of H5N1 HPAI to cause disease and death in animals and humans.

H5N1 HPAI can infect wild and domestic birds and poultry, humans, domestic cats, and dogs. Swine, palm civets, cynomolgus macaques, New Zealand white rabbits, stone martens, tigers, leopards, and rats can also become infected with the H5N1 HPAI virus. Ferrets are very susceptible to H5N1 HPAI infection as well as other human influenza viruses. Cats are not usually susceptible to avian influenza viruses; however, a research study published in September 2004 demonstrated that domestic cats can become infected with the H5N1 HPAI virus and are capable of transmitting the virus to other cats. Like cats, dogs are not usually susceptible to avian influenza viruses; however, an unpublished study performed in 2005 by the National Institute of Animal Health in Bangkok indicated that dogs could be infected with the virus. No clinical disease was detected in association with that study. This limited information is insufficient to determine how susceptible dogs are to the virus. Pet birds are susceptible to infection with avian influenza viruses, however, because the H5N1 HPAI virus has not yet been identified in the United States, risk of infection for pet birds is very low.

Humans are susceptible to H5N1 HPAI infection.

There are no commercial vaccines for H5N1 HPAI in birds and animals available in the United States.

Swine Influenza

Swine influenza is a respiratory disease that regularly causes illness in swine. It is generally found in North and South America, Asia, and Europe and has been reported in Africa.

Outbreaks of swine influenza are most commonly associated with commercial herds during the introduction of new animals. Most affected swine will recover within five to seven days in the absence of complications. Severe bronchopneumonia may develop as a secondary complication, and is a high risk factor for mortality. Once introduced, the swine influenza virus may become endemic in herds. Annual outbreaks may be observed, primarily during the colder months of the year. Young, naive pigs are at increased risk of infection.

Some strains of swine influenza have infected humans; however, reports are infrequent and infections are typically not spread from person to person. Virus transmission has been documented in public settings such as fairs and exhibitions. People can also transmit human influenza to swine.

Clients with pet swine should take precautions to protect their pet against any strain of influenza that is known to affect swine. These precautions may include having the pet vaccinated against swine influenza and keeping the pet away from other swine that are suspected to have a swine influenza infection and humans suspected to have human influenza.

Commercial vaccines are available against the most commonly encountered strains of swine influenza.

Novel H1N1 Influenza (Swine Flu)

While called "swine flu," the novel H1N1 influenza virus appears to at some point in the past have jumped from swine to people and evolved into a human disease. This virus readily spreads from person to person. When the human outbreak was first detected in April 2009, the virus had never been isolated from swine.

Cooperative State/Federal novel H1N1 swine influenza surveillance procedures have been established for swine in the United States. As of November 4, 2009, H1N1 has been isolated from healthy pigs at Minnesota State Fair and a commercial herd with respiratory disease in Indiana. In both instances the humans is suspected to have introduced the virus into the herds. There have also been a few cases reported in other countries which produced a mild to moderate illness in swine. Swine that recover from the illness are no longer infectious. Due to the low number of domestic swine in Florida, and the fact that most are not raised in commercial confinement operations but in backyard herds, the risk of introduction and spread of the novel H1N1 virus in Florida

swine is small. H1N1 swine influenza testing is available at the Kissimmee Animal Disease Diagnostic Laboratory and national USDA laboratories.

Properly prepared pork poses no threat of virus transmission from swine food products to humans.

At this time, there is no commercially available vaccine for the novel H1N1 influenza virus in swine.

The novel H1N1 virus has also been isolated from turkeys, two ferrets and a cat. The ferrets and cat developed a respiratory illness after close contact with their sick owners. One of the ferrets died of the disease.

The novel H1N1 influenza virus is continuing to spread in the human population. Since the appearance of the novel strain last spring, outbreaks continued among Florida residents, primarily in summer camps and other child care facilities. Overall, the level of influenza has remained higher than what is normally seen in the summer months. Outbreaks in schools have been common this fall. The virus has shown no change in virulence over time and remains predominantly in the 5-24 and 25-49 year old age groups. For more novel H1N1 influenza statistics, please visit: http://www.doh.state.fl.us/disease_ctrl/epi/htopics/flu/reports.htm.

Currently, the Florida Department of Health is pursuing several avenues to mitigate disease outcomes and engage in prevention activities. They include intensive age appropriate posters for grades K-12; implementation of masks for sick children that come to school until they can be taken home; thermometers purchased for each school, grades K-12 (public and private) to perform temperature checks, and an aggressive public media campaign to reinforce community hygiene protocols.

County Health Departments are currently vaccinating people at high risk for influenza following the recommendations of the American College of Immunization Practices (ACIP) for priority vaccination. All vaccinations will be voluntary and there has been no suggestion of mandatory vaccinations for any age group.

Conclusion

Influenza viruses, particularly avian and swine influenza viruses, have been shown to be transmissible between species with animal to people and people to animal transmission possible. Veterinarians should take safeguards to prevent disease passage to themselves and their staff and take steps to reduce human and animal exposure. The use of gloves, protective clothing, N95 respirators and eyewear by staff when examining sick animals and limiting human and animal exposure to affected people and affected animals is recommended. People should avoid close contact with other people and animals until 7 days after symptom-onset or 24h after they have been symptom-free.

Florida Administrative Rule 5C-20.004 requires that any person who has knowledge of, or suspects, the existence of any animal disease or pest in the state that might result in unusually high animal loss, economic damage, or is suspected of causing human disease, should immediately report suspicions or findings to the Florida Department of Agriculture and Consumer Services, Division of Animal Industry (State Veterinarian), at (850) 410-0900; fax: (850) 410-0915; or after hours: (800) 342-5869 or e-mail: rad@doacs.state.fl.us.

Avian Influenza is a reportable animal disease in Florida and must be reported. Although not a reportable animal disease, any suspected novel H1N1 influenza infection in swine should be reported as well.

Any veterinarian with questions regarding these animal diseases or their public health significance should contact the Florida Department of Agriculture and Consumer Services, Division of Animal Industry (State Veterinarian) at (850) 410-0900 or the Florida Department of Health (State Public Health Veterinarian) at (850) 245-4299.

For more information about veterinary infection control, please visit: <http://www.nasphv.org/Documents/VeterinaryPrecautions.pdf>.

For more information on animal influenza viruses, please visit: <http://www.cfsph.iastate.edu/Factsheets/pdfs/influenza.pdf>

For current updates on animal infections with the novel H1N1 virus, please visit: http://www.avma.org/public_health/influenza/default.asp