Canine Influenza (CIV) Overview
Compiled January 2018 by Dr. Emilio DeBess

Basics
Canine influenza (CIV) is a highly contagious respiratory tract infection largely caused by 2 subtypes of the influenza A virus, H3N8 and H3N2. Influenza A viruses are segmented, single-strand RNA orthomyxoviruses that are host-specific and circulate worldwide. While CIV is considered a primary pathogen, it has also been associated with kennel cough disease complex.

Transmission
Canine influenza virus is spread most easily in overcrowded or high-population environments, such as shelters, boarding centers, dog parks, pet stores, dog shows, veterinary hospitals, and grooming facilities. Spread occurs via aerosol transmission, fomites, and direct oronasal contact. Because of the potential for incidental exposure or fomite transmission, single-pet homes are also considered susceptible to influenza virus infection.
Currently, CIV is perpetuated mostly through shelters, with other outbreaks occurring sporadically. A seasonal pattern seems to occur with CIV outbreaks, especially with H3N8. Peak infections have occurred in mid-winter months, as well as summer through mid-fall months.

Clinical Signs
The most common clinical signs are coughing, anorexia, lethargy, pyrexia, sneezing, ocular discharge, and clear to mucopurulent nasal discharge. Dyspnea may also be seen in severe cases, especially with H3N2 infection. Fever usually only occurs in the beginning stages of infection and is often low grade. Cough is usually dry and nonproductive. If pneumonia is present, clinical signs can also include more significant pyrexia, a productive cough, tachypnea, and/or dyspnea.

Treatment/Management/Prevention:

SPECIFIC THERAPY
No specific treatment exists for CIV. While many infections are self-limiting, supportive care may be needed for more seriously affected dogs.

SUPPORTIVE THERAPY
Supportive care (e.g. IV fluids, supplemental oxygen) may be needed for patients with moderate to severe clinical signs. Nutritional support may also be necessary because anorexia is a common clinical finding. Nebulization with saline and/or coupage up to 4 times daily may be helpful for pneumonia. N-acetylcysteine as a mucolytic may be useful in combination with saline nebulization.

While antibiotics are not warranted for viral infections, secondary bacterial infections are common with CIV. Therefore, antibiotics may be helpful as preventative and therapeutic measures. Antibiotics are likely indicated for patients with fever, purulent nasal discharge, productive coughing, or pneumonia. In the absence of culture, commonly used antibiotics include amoxicillin-clavulanate, azithromycin, doxycycline, and enrofloxacin. In severe cases, hospitalization and IV antimicrobials can be considered.

While antiviral drugs (e.g. oseltamivir) have been utilized in clinical practice for some viral infections, their use for CIV is not recommended. Their safety and efficacy are not fully established in dogs; they are less effective if not used early in the disease course and most dogs are not brought in for treatment until later; drug-resistant viral strains may result; and viral mutations that can result from antiviral use could transfer across species strains.

Corticosteroids are generally contraindicated unless chronic respiratory inflammation or severe ARDS-type symptoms occur. Anti-inflammatory doses are recommended over immunosuppressive doses. Prolonged and increased shedding of H3N2 virus has been reported in dogs receiving immunosuppressive doses of prednisolone.

Cough suppressants are not recommended for patients with confirmed or suspected bacterial pneumonia as they can decrease bacterial and mucus clearance from the respiratory tract. Their use may be warranted for terminating a perpetual cough.
cycle. Bronchodilators are generally of limited use but may be helpful in breaking the cough cycle. Bronchodilators may also help alleviate severe bronchitis.

Preventive Measures:

Prevention, Isolation, Disinfection
Recommend that owners avoid high-risk environments (e.g. dog parks, kennels, dog shows) during outbreaks. Avoid hospitalization of ill dogs, if possible, to prevent spread of the virus. Enforce a minimum of 20 feet of separation between infected dogs and healthy populations. Dogs may require isolation for at least 21 days from onset of illness for H3N2 subtypes, or if the subtype is unknown. Biosecurity measures include wearing gowns, booties, disposable gloves, as well as other fomite prevention measures (e.g. sanitizing stethoscopes). Because cats and ferrets may be susceptible, isolation can be extended to prevent spread beyond just canine companion animals.

Influenza viruses are sensitive to routine disinfectants and are considered relatively easy to kill outside the host. Canine influenza virus has been shown to persist in the environment for only 48 hours. Due to the highly infectious nature of CIV, however, kennels and facilities may require evacuation for up to 1-2 weeks. Equipment and facilities can be cleaned with a 1:30 dilution of bleach or quaternary ammonium compounds. Adequate contact time (generally 10 minutes) should be ensured.

Vaccination
Licensed vaccines are available for dogs for both H3N8 and H3N2 subtypes. Currently marketed vaccines are inactivated, adjuvanted vaccines for either H3N8 or H3N2, or an inactivated bivalent (for both strains) vaccine. Give an initial vaccination followed by a booster 2-4 weeks later. Yearly vaccination is recommended for dogs in high-risk or endemic environments. Current vaccines do not prevent CIV infection but they significantly decrease the severity and degree of infection, illness, and viral shedding. Onset of significant immunity may take up to 1 week after the second booster, thus single vaccines are unlikely to be protective for dogs initially entering shelters or other high-risk facilities.

At this time, several live-attenuated influenza vaccines are being tested. Live-attenuated vaccines typically produce better immunity and protection than inactivated influenza vaccines.

References:
9) Barr S C: Kennel Cough and Canine Influenza. Central Veterinary Conference 2013.