

ADDRESSING CANINE INFLUENZA

*Your guide to the prevention and management
of canine influenza virus*



Tips and guidelines for your clinic from Merck Animal Health,
the leader in canine influenza



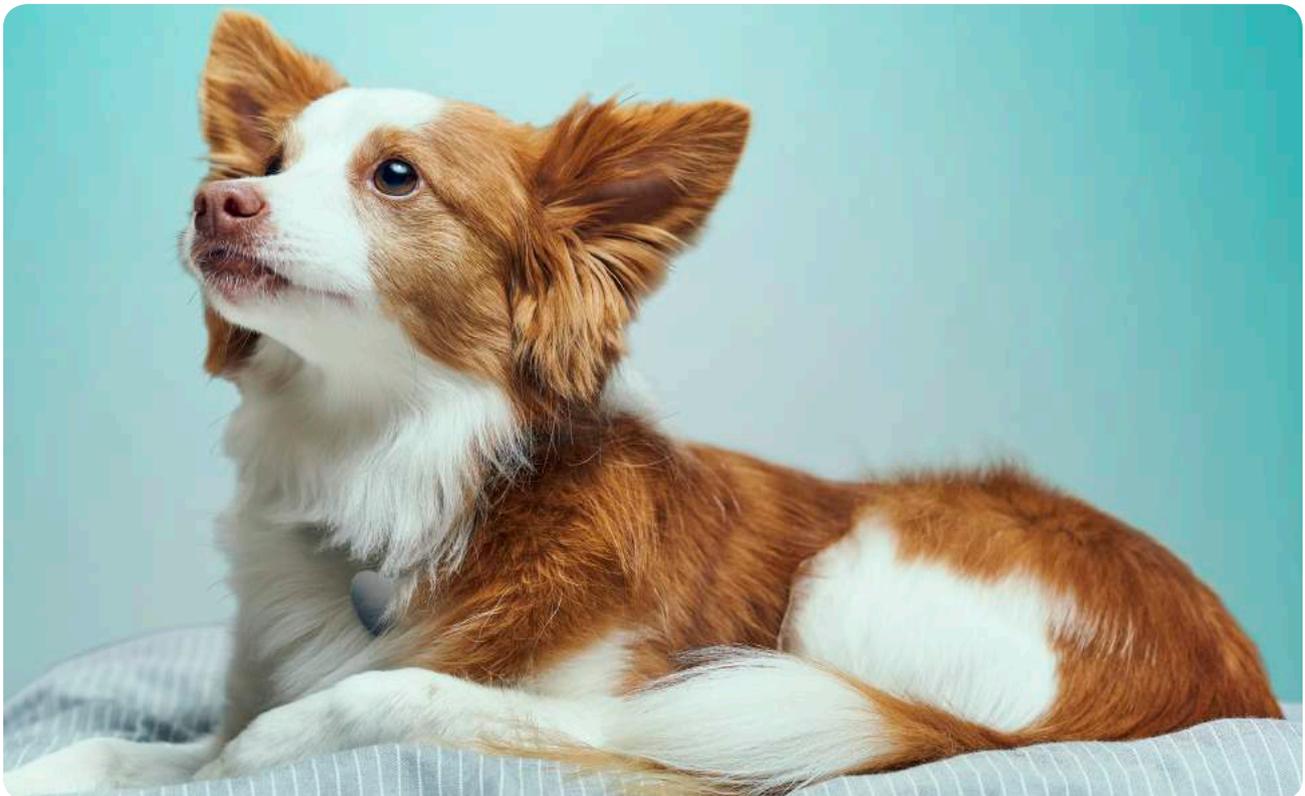
CONFRONTING CONTAMINATION

What contributes to canine influenza contamination?

- Poor ventilation
- Ineffective cleaning techniques
- Porous surface types
- Lack of isolation and quarantine
- Prevalence of fomites
- Improper identification of the organism
- Accumulation of organic material

The four levels of decontamination

- 1 Cleaning**
Provides basic hygiene
- 2 Sanitation**
Decreases the number of infectious agents
- 3 Disinfection**
Destroys most harmful microorganisms
- 4 Sterilization**
Kills all life forms at all levels



HOW AND WHERE TO DECONTAMINATE

Ideal decontamination¹

- Remove organic debris
- Clean (scrub) with a detergent/degreaser
- Rinse
- Disinfect by applying appropriate disinfectant
- Scrub and let disinfectant stand for appropriate contact time
- Rinse
- Dry using clean towel or squeegee

Important areas to clean

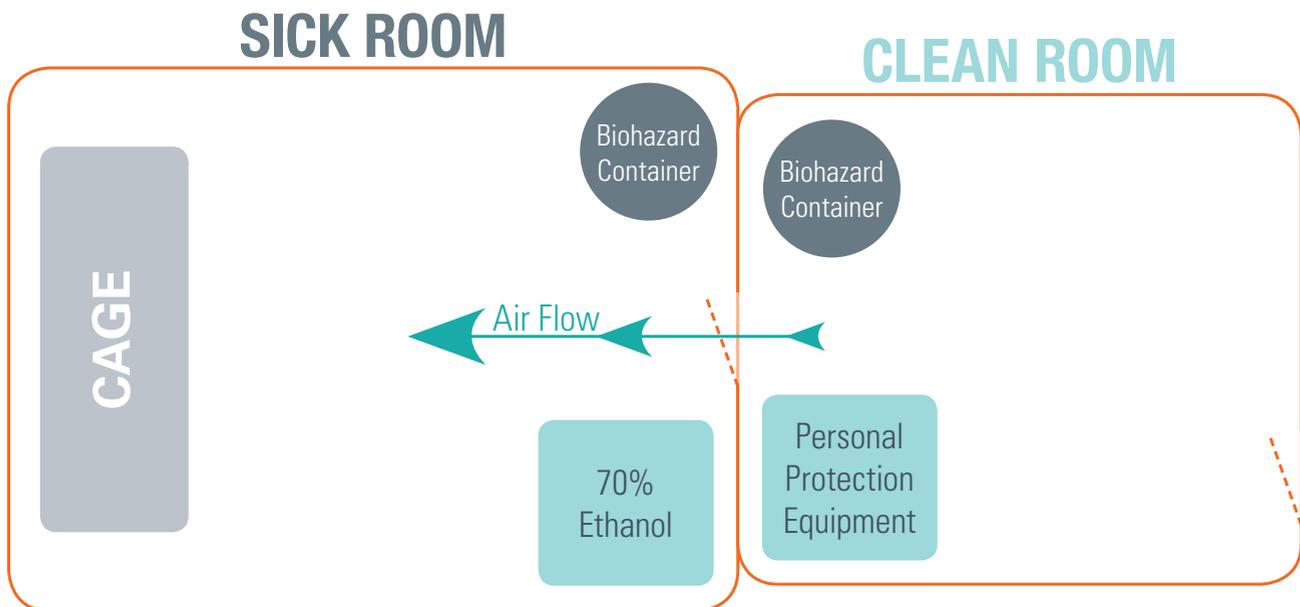
- Cages
- Toys, bowls, bedding, etc
- Floor outside the cage
- Floors throughout the clinic
- Waiting room
- Dog runs
- Yard
- Carriers
- Offices
- Storage areas
- Ventilation and heating ducts
- Frequently handled items (doorknobs, keys, cell phones, keyboards, etc)

Remember, the most common sources of contamination are people's hands, shoes, and clothing

ISOLATION AND QUARANTINE

How to properly isolate and quarantine

- Consider all exposed and sick dogs as potentially infected and shedding virus
- Isolate exposed dogs on site—use physical barriers if an isolation room is not available
- Create separate ventilation
- Use separate entrances for sick and healthy pets
- Spray yourself with 70% ethanol before removing the personal protection equipment
- Dedicate shoes solely for the sick room
- Gowns can be reused if left in the sick room
- Double glove in the sick room and remove the outer pair before leaving the sick room



MAXIMIZE THE EFFECTIVENESS OF ISOLATION AND QUARANTINE

Wear personal protective equipment (PPE)

- Mask
- Gown
- Double gloves
- Booties
- Hairnet
- Dedicated scrubs
- Dedicated shoes

Practice good sanitation^{1,2}

- Washing scrubs: use heat (hot cycle >130°F), bleach, and detergent
- Washing hands: scrub for at least 20 seconds and dry

Care and treatment priorities

First: Healthy pets (young, senior, adult)

Second: Pets who are ill due to noninfectious causes

Last: Pets who are ill due to infectious causes



TESTING PROCEDURES FOR CANINE INFLUENZA

Canine influenza is hard to diagnose

Since many other pathogens can cause similar clinical signs, canine influenza infection cannot be diagnosed by clinical signs alone. The best approach to diagnose cases of canine influenza and other infectious respiratory diseases is to submit nasal and oral-pharyngeal swabs to a veterinary diagnostic laboratory. Requesting a canine respiratory polymerase chain reaction (PCR) panel will provide the broadest diagnostic evaluation and the greatest chance for a positive diagnosis.

Dogs sick for 5 days or less

- Collection of nasal and oral-pharyngeal swabs is recommended
- Dogs infected with canine influenza H3N2 may shed virus intermittently for up to 24 days, but there is less of a chance of finding viruses if the sample is taken past 5 days
- Antibiotic administration may interfere with detection of respiratory pathogens

Dogs sick for more than 5 days

- Canine influenza H3N2 may be detectable on a nasal swab in infected dogs for up to 24 days, but other viral pathogens may be detectable only for 3-5 days after clinical signs appear
- A single serum sample can be collected and submitted for influenza HAI. The laboratory performing the testing should be able to help with assay interpretation
- Serology procedure: Obtain 0.5 to 1 mL of serum in a red top tube

Did you know?

During the 2015 canine influenza outbreaks in Atlanta, GA, and Chicago, IL, more than 650 dogs were tested in the Merck Animal Health Diagnostic Support Program, which supported the detection of canine influenza virus H3N2 in the United States.



ADDITIONAL TESTING PROCEDURES FOR CANINE INFLUENZA

Swab procedure

- After gently swabbing the nostrils or the pharyngeal area with a polyester or dacron sterile swab on a plastic shaft, the swab should be placed in a sterile red top tube with 0.5 mL of saline; the swab must remain in the tube
- One sample will be used to test for a variety of pathogenic viruses and bacteria
- The canine respiratory panel uses PCR to identify genetic material that might be present in the sample
- Leave swabs in tubes and swirl to dislodge sample

Note: collection of an acute phase serum sample should be done at the same time the nasal and pharyngeal swabs are collected. An additional blood (serum) sample collected 10 days to 2 weeks later can be used to identify a rising titer for several of the respiratory pathogens if the PCR assays do not detect virus in the samples.

Sample storing information

- Storing and shipping the nasal swab samples appropriately is critical for accurate results
- Samples should be kept refrigerated until they are shipped later that day. If the samples are allowed to warm to room temperature, the results may be inconclusive
- Swab samples should be shipped with ice packs to make sure they are kept chilled during transport. Make sure to pack the samples securely to prevent damage during transit
- For samples that will not be shipped on the same day as they are collected, refrigerate and then ship with ice packs

If you have questions about canine influenza or diagnostic testing procedures, or would like to obtain information about submitting samples through our testing program, please contact Merck Animal Health Technical Services at 800-224-5318. Our technical service team will be happy to provide assistance in the diagnosis of infectious respiratory diseases.

TIPS FOR CONTROLLING THE SPREAD OF CANINE INFLUENZA

- Dogs with suspected canine influenza infection that enter the facility should be isolated immediately and evaluated in a separate room
- After evaluation, the floors, walls, and tables used in the room should be thoroughly disinfected. Particular attention should be given to doorknobs and other objects that were touched by humans who were in contact with the dog
- Canine influenza is easily killed by disinfectants that are commonly used in veterinary clinics (eg, quaternary ammonium compounds, bleach solutions at a 1 to 30 dilution, or potassium peroxymonosulfate)
- Hospitalized dogs should be isolated for the protection of other dogs
- The air supply should be separated ideally by a full wall and door, but at least as separate as possible; a designated area within a common air space may not be adequate to prevent transmission of the virus
- At a minimum, gloves and a gown should be worn while handling dogs with canine influenza infection
- Staff should wash their hands with soap and water or disinfect them with an alcohol-based hand sanitizer after handling the infected animal
- Shoes should be disinfected with an appropriately maintained disinfectant footbath when exiting the isolation room. Dedicated shoes are preferred
- Dogs that are at greatest risk for infectious respiratory disease are those that visit dog parks, doggie day cares, groomers, and boarding facilities
- Viral disease is best prevented by effective vaccination

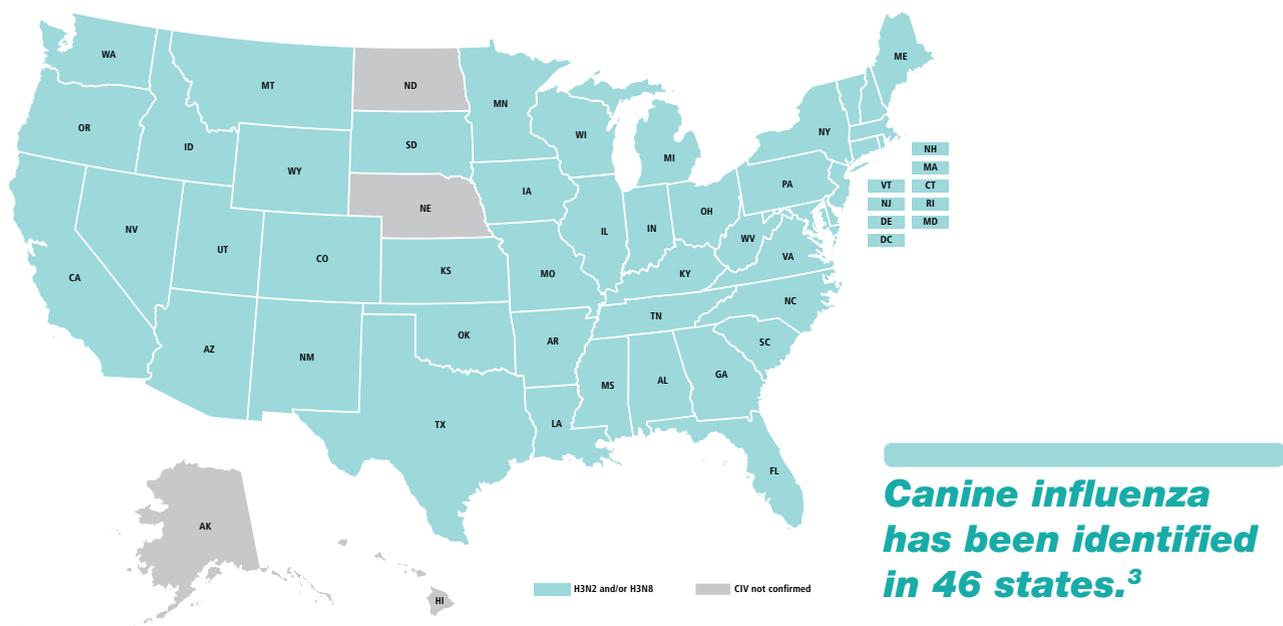
For more information about canine influenza, please visit www.dogflu.com



WHAT PET OWNERS SHOULD KNOW

- Canine influenza is not the same as canine Parainfluenza or Bordetella. Many different pathogens can play a role in canine (kennel) cough
- Canine influenza is highly infectious and the virus spreads very quickly from dog to dog
- Canine influenza can be spread by direct contact with respiratory discharge from infected dogs, through the air via a cough, bark, or sneeze, and by contact with contaminated objects such as dog bowls and clothing
- To prevent the spread of disease, owners should wash their hands with soap and water or disinfect them with an alcohol-based hand sanitizer after contact with dogs
- Dog owners whose dogs are coughing or showing other signs of respiratory disease should not participate in activities or bring their dogs to facilities where other dogs can be exposed to the virus
- Owners should call their veterinarian immediately if their dog has the following clinical signs:
 - Coughing
 - Discharge from the nose or eyes
 - Loss of appetite
 - Lethargy/lack of energy

THE GROWING PREVALENCE OF CANINE INFLUENZA H3N2 AND H3N8*



*Cornell University, *Test Summary for canine Influenza Virus in Dogs not Affiliated with Greyhound Racetracks, 2009*; Crawford, et al., *Transmission of Equine Influenza Virus to Dogs, P.C., 2005*. *Syndromic surveillance data of Cynda Crawford, DVM, PhD, University of Florida*; Edward Dubovi, PhD, Cornell University; Sanjay Kapill, DVM, PhD, ACVIM, Oklahoma State University; and IDEXX Laboratories. April 2018.

A LIST OF FREQUENTLY ASKED QUESTIONS ABOUT CANINE INFLUENZA

What is canine influenza virus?

Canine influenza virus causes a respiratory infection in dogs that is also known as dog flu. The infection is very contagious to other dogs. Common signs are fever, lethargy, decreased appetite, cough, and runny nose. Most dogs have a mild form of the infection, but some dogs may develop pneumonia and have a more serious disease course that requires hospitalization.⁴

How does canine influenza spread?

Canine influenza is very contagious, meaning that it is easily spread from dogs that are currently infected to other dogs. Canine influenza can pass from dog to dog through virus particles in the air (eg, through coughing or sneezing) or by coming into physical contact with other dogs (eg, touching noses). It can also be picked up if a dog touches or plays with objects that were touched by infected dogs (eg, food bowls, toys). Humans can even transmit the virus between dogs. For example, they may spread the virus if they pet an infected dog, or even touch a toy or doorknob that an infected dog has had contact with, and then touch another dog before washing their hands.

You can take important steps to minimize the spread of canine influenza^{4,5}:

- Keep your dog at home if he or she has signs of a respiratory infection, and contact your veterinarian regarding appropriate care and evaluation
- Routinely wash your dog's food and water bowls and toys with soap and water
- Sanitize your hands with soap and water or an alcohol-based hand sanitizer, and wash your clothes after coming in contact with a dog that has signs of a respiratory infection
- Make sure the professionals you know who provide care for your dog(s) are knowledgeable about canine influenza and are taking appropriate precautions to minimize its spread



Can canine influenza infect humans?

To date, there is no evidence that canine influenza can infect humans, and there has not been a single reported case of a canine influenza infection in a human. The Centers for Disease Control and Prevention (CDC) is closely monitoring the situation.⁶

In general, the canine influenza virus is considered to pose a low threat to humans. The virus infects dogs and spreads between dogs, but there is no evidence that this virus can infect humans. However, influenza viruses can change so that they can infect other animals, potentially including humans. For this reason, the CDC and its partners are monitoring canine influenza (as well as other animal influenza viruses).⁶

Canine influenza H3N8 was the first influenza virus to adapt to the dog and is thought to have originated from an equine H3N8 influenza virus strain. In contrast, canine influenza H3N2 is thought to have originated in birds and is closely related to the Asian strain of H3N2 in circulation in Chinese and South Korean dog populations. More information regarding influenza can be found on the CDC website.

How can I prevent my dog from getting canine influenza infection?

The most important step is to vaccinate your dog, as viral disease is best prevented by effective vaccination.⁵ There are vaccines available to control the spread of canine influenza virus and minimize its impact. Just like human flu shots, canine influenza vaccines may not completely prevent canine influenza but will make it less likely. And if a vaccinated dog does get the flu, the signs are likely to be milder.

If your dog exhibits any signs of respiratory disease (cough, runny nose, fever, decreased appetite), call your veterinarian.

You should also remain aware of any information related to outbreaks of canine influenza in your area. Knowledge and common sense are your best defenses against canine influenza.



FREQUENTLY ASKED QUESTIONS ABOUT CANINE INFLUENZA (CONTINUED)

What precautions should I take if I have to board my dog?

You'll need to do a little research before and after boarding. Start your investigation by talking with your veterinarian. Find out which facilities have the best record or reputation. When you find a boarding facility you like, check with the local Better Business Bureau or another authority to make sure no complaints have been filed against it.

Next, tour the facility before you bring your beloved dog to stay there. Satisfy yourself that the boarding facility you choose is safe, clean, and comfortable, providing good care from knowledgeable, experienced staff. Before finishing your research visit, ask what plans the facility has in place to handle health emergencies, including disease outbreaks. Also, confirm that the facility requires all boarding animals to meet health standards. The facility should insist that animals are current on vaccinations, including protection against canine cough (*Bordetella*, parainfluenza, and other respiratory agents) and canine influenza.

Make sure your dog is properly identified before dropping it off for boarding. Most facilities will provide a highly visible ID collar. Permanent identification, such as a microchip, is equally important. Be sure your pet's registration and your contact information are kept up to date in a national pet recovery database. Boarding facilities should require owners to provide the name and contact information of the pet's veterinarian and/or a signed release form authorizing medical care if there is a veterinarian on staff. Also, maintain your composure when dropping off and retrieving pets from boarding facilities, so they can model your good behavior. Finally, after retrieving your dog from the facility, examine your pet closely for signs of fleas, scrapes or bruises, or illness, such as discharge from the eyes or nose.



What are the signs of canine influenza infection?

Dogs with canine influenza infection often have a cough that may be dry or productive (coughing up yellow sputum). They may act tired and lose their appetite. They may also have a clear nasal discharge that turns yellow or green.^{4,7} A small percentage of dogs do not show any signs of canine influenza but can still pass the infection to other dogs.⁴ Most dogs have a mild disease course, but 1% to 20% have a more serious course and may develop pneumonia.⁸ These dogs may need to be hospitalized.⁸ Seeking appropriate care early may minimize this risk.

If your dog has any of these signs, consult your veterinarian and avoid taking the dog anywhere where other dogs could be exposed (other than the veterinarian's office if so instructed) until he or she has made a full recovery.

What do I do if my dog has signs of canine influenza infection?

If your dog shows signs of a respiratory infection such as coughing or runny nose, make an appointment with your veterinarian. Your veterinarian can determine the cause of your dog's signs and can prescribe safe medications to help your dog. It is never a good idea to treat your dog at home using human drugs, as many of these drugs have not been studied in dogs and may be harmful.

If your dog is coughing (or even just getting over a cough), you should keep your dog home for a couple of weeks. Most importantly, it gives your dog a chance to recover fully. And, in case your dog is contagious, it protects other healthy dogs and prevents spread of disease.

FREQUENTLY ASKED QUESTIONS ABOUT CANINE INFLUENZA (CONTINUED)

How is canine influenza infection diagnosed?

Your veterinarian can collect nasal swab samples in the clinic to determine if the infection is likely to be canine influenza. The veterinarian might collect a blood sample when you first take your dog into the clinic, and again in 2 or 3 weeks. It might take about 2 weeks for the results to return. In the meantime, your veterinarian can start appropriate treatment to make your dog more comfortable. At this time, there is no treatment specifically for viral infections.

What are the treatment options for canine influenza infection?

As with other viruses, there are no specific drugs to treat canine influenza infections. The illness must simply run its course. Treatment options are focused on providing supportive care and making sure the dog is as comfortable as possible, hydrated, and eating well; those things will help boost the dog's immune system so it can fight the virus on its own. Dogs that have thick nasal discharge or signs of pneumonia are usually given an antibiotic because they are likely to have a secondary bacterial infection. Some dogs with more severe illness may require hospitalization for intravenous fluids and antibiotics.⁴ Contact your veterinarian if your dog has signs of a respiratory infection for recommendations regarding appropriate care and evaluation.

Is my dog likely to die from canine influenza infection?

Fortunately, the mortality rate for dogs with canine influenza infection is very low. It is important to seek veterinary care at the first signs of a respiratory infection in your dog because early treatment can result in better outcomes.

References: 1. Sanitation in animal shelters. UC Davis Koret Shelter Medicine Program website. <http://www.sheltermedicine.com/library/sanitationin-animal-shelters>. Updated June 2015. Accessed October 23, 2015. 2. Walter WG, Schillinger JE. Bacterial survival in laundered fabrics. *Appl Microbiol*. 1975;29:368-373. 3. Canine influenza H3N2 updates. Cornell University College of Veterinary Medicine website. <https://ahdc.vet.cornell.edu/news/canine-influenzachicago.cfm>. Updated August 8, 2015. Accessed September 28, 2015. 4. Canine influenza update. UC Davis Koret Shelter Medicine Program website. <http://www.sheltermedicine.com/library/canine-influenza>. Updated July 2015. Accessed October 23, 2015. 5. American Veterinary Medical Association (AVMA). canine influenza reference guide. AVMA website. <https://www.avma.org/KB/Resources/Reference/Pages/Canine-Influenza-Backgrounder.aspx>. Updated April 22, 2015. Accessed October 23, 2015. 6. Centers for Disease Control and Prevention (CDC). Key facts about canine influenza (dog flu). CDC website. <http://www.cdc.gov/flu/canineflu/keyfacts.htm>. Accessed October 23, 2015. 7. Canine influenza. The Center for Food Security & Public Health. College of Veterinary Medicine, Iowa State University. http://www.cfsph.iastate.edu/Factsheets/pdfs/canine_influenza.pdf. Updated June 2014. Accessed October 23, 2015. 8. Crawford C, Spindel M. Canine influenza. In: Miller L, Hurley K, eds. *Infectious disease management in animal shelters*. Ames, IA: Wiley-Blackwell; 2009:173-180.



MERCK ANIMAL HEALTH IS COMMITTED TO SUPPORTING VETERINARY COMMUNITIES DURING CANINE INFLUENZA OUTBREAKS

Contact Us

To learn more, contact your Merck Animal Health sales representative, your distributor representative, visit www.merck-animal-health-usa.com, or give us a call.

Customer Service

1.800.521.5767

(Monday-Friday, 9:00 AM – 6:00 PM EST)

Technical Service

1.800.224-5318

(Monday-Friday, 8:30 AM – 5:00 PM EST)

Vaccine Protocol Help Line

1.866.437.7955

(Monday-Friday, 8:00 AM – 5:00 PM EST)

