

COVID-19 and Pets: Frequently Asked Questions

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Website Resources:

UC Davis Veterinary Medical Teaching Hospital

<https://www.vetmed.ucdavis.edu/hospital>

UC Davis Veterinary-related coronavirus resources

<https://www.vetmed.ucdavis.edu/coronavirus-resources>

Veterinary Information Network/Veterinary Partner

[VIN FAQ on COVID-19 for pet owners](#)

World Organization for Animal Health (OIE)

[Questions and answers on the 2019 coronavirus disease](#)

U.S. Centers for Disease Control and Prevention (CDC)

[Coronavirus disease 2019: Frequently asked questions and answers](#)

World Health Organization (WHO)

[Q&A on coronaviruses](#)

American Veterinary Medical Association (AVMA)

[Frequently asked questions about coronavirus disease 2019](#)

Worms and Germs Blog

<https://www.wormsandgermsblog.com/>

IDEXX COVID-19 Customer Resources

<https://www.idexx.com/en/about-idexx/covid-19-resources/>

Frequently Asked Questions for Pet Owners:

1. What is a virus?

A virus is a microorganism consisting of a nucleic acid in a protein coat, sometimes with a lipid envelope that surrounds this, that can infect animal cells and hijack the machinery of those cells in order to make copies of itself, or replicate. Viruses cannot multiply outside the living cells of an animal. Viruses are too small to be seen with a regular (light) microscope. In contrast,

bacteria are single-celled microorganisms which have cell walls but lack organelles and an organized nucleus.

2. Why can't antibiotics be used to treat coronavirus infections?

Virus infections are treated with antiviral drugs, whereas bacterial infections are treated with antibacterials (antibiotics). Antiviral drugs can be toxic because they work within an animal cell, and many only attack one type or one group of viruses. Thus there are fewer antiviral drugs than antibiotics. There are few antiviral drugs for coronaviruses, but efforts to find a cure for important coronavirus infections of animals may be key for finding a treatment for COVID-19, the disease caused by SARS-CoV2 (<https://www.fox10phoenix.com/news/feline-coronavirus-treatment-could-stop-spread-of-covid-19-in-humans-doctor-says>). Currently a drug called remdesivir is being used in clinical trials in China to treat COVID-19.

3. How are viral diseases typically transmitted?

There are many mechanisms through which viral diseases may be transmitted. The ability of a virus to be transmitted depends on the parts of the body it is shed from (such as saliva, feces, urine), the amount of virus shed, and how well that virus survives in the environment. SARS-CoV2 transmission primarily occurs as a result of exposure to droplets expelled during coughing or sneezing, but the droplets can drift in the air for up to half an hour before settling on a surface. Transmission via touching a contaminated surface or object (i.e., a fomite) and then touching the mouth, nose, or possibly eyes is also possible, but appears to be a secondary route.

4. Can I get infected by handling objects that could be contaminated by coronavirus?

Contaminated objects that can act as a source of transmission are referred to as *fomites*. Viruses that have a fragile outer lipid envelope, like the coronavirus, don't tend to survive very long periods of time in the environment, usually hours to a few days. This contrasts with non-enveloped viruses like canine parvovirus, which can survive many months, even longer than a year, in the environment. Enveloped viruses are usually very susceptible to soap and disinfectants, when they are applied properly. A recent study published in the NEJM suggests that SARS-CoV2 may be capable of surviving up to 3 days on some surfaces, like plastic and stainless steel, but only up to a day on cardboard, lessening the concern about people becoming infected from deliveries. The amount of viable (alive) virus on these surfaces decreases dramatically over these periods, and the chance of people getting infected by contact with these surfaces is very low. Washing hands PROPERLY (attention to all surfaces of the hand, singing happy birthday) or properly applying hand sanitizer is the best way to prevent infection.

5. What is a pandemic and how does it differ from an epidemic?

An epidemic is a widespread occurrence of an infectious disease in a community at a particular time. According to the WHO, a pandemic is "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people." The CDC defines a pandemic as "an epidemic that has spread over several countries or continents, usually affecting a large number of people." Thus, epidemics can be a 'subset' of pandemics.

6. *Are viral diseases common in pets and what has been done to decrease the prevalence of these diseases?*

There are many, many viruses that cause disease in dogs and cats. The vast majority of viruses that infect and cause disease in dogs and cats cannot infect and cause disease in humans. Examples include feline immunodeficiency virus (which causes a disease in cats that resembles AIDS), feline leukemia virus, several different feline and canine respiratory viruses, a serious coronavirus infection of cats called feline infectious peritonitis virus, canine distemper virus and canine parvovirus. Vaccines developed for some virus infections, such as canine parvovirus infection and distemper, when administered properly, can be completely protective. This means timing puppy and kitten vaccinations properly, using properly stored vaccines, and ensuring that puppies are kept relatively isolated until at least a week after the last (16 week) puppy vaccination. Other measures include basic hygiene (handwashing), proper disinfection and quarantine in breeding and boarding kennels, and widespread testing in order to detect the virus as well as immune populations, taking appropriate action should an outbreak of respiratory disease occur.

7. *Are dogs and cats commonly susceptible to coronaviruses?*

Coronaviruses have been known for decades to be major causes of respiratory, enteric, or systemic infections of companion animals and livestock. They typically cause disease in very young animals, immunocompromised animals, and populations that are overcrowded or have poor nutrition and hygiene. Just like with SARS-CoV2 and humans, healthy, immune competent animals are often infected without showing any signs (animals do not experience 'symptoms', which are feelings of illness). Feline and canine coronaviruses are widespread among dog and cat populations. The main coronaviruses are canine enteric coronavirus, canine respiratory coronavirus, canine pantropic coronavirus, and feline infectious peritonitis virus.

8. *How are coronavirus infections of dogs and cats spread, what signs do they cause, and are there vaccines for these diseases?*

- a. Canine enteric coronavirus (also known as canine coronavirus): Most cases of canine enteric coronavirus infection are contracted by oral contact with infected fecal matter that contaminates the environment, which we call fecal-oral transmission. A dog may also become infected by eating from contaminated food bowls or by direct contact with an infected dog. Typically this virus causes mild diarrhea in puppies less than 6-8 weeks of age. There is a vaccine, but the disease is not widely recognized and we usually start giving vaccines to puppies at 6-8 weeks of age, so it is controversial and not considered a 'core' vaccine for dogs. Canine enteric coronavirus can occasionally cause more severe disease, especially when it infects a dog with other gastrointestinal viruses like canine parvovirus. There have been some dogs reported worldwide (primarily in Italy) with a severe pantropic coronavirus infection, where multiple organs in the body are infected by the virus.
- b. Canine respiratory coronavirus: Canine respiratory coronavirus is transmitted the same way that SARS-CoV2 is transmitted, through respiratory droplet inhalation and fomite spread in crowded environments such as boarding kennels. It is one of the

- many (MANY) causes of canine infectious respiratory disease complex (also known as 'kennel cough'). Interestingly, this virus was first identified in the United Kingdom in boarding kennels and subsequently spread rapidly worldwide, and is more closely related to a bovine coronavirus and a coronavirus that causes the common cold in humans, known as OC43. There is no vaccine for this infection, but vaccines exist for other causes of CIRDC, like *Bordetella* and canine parainfluenza virus.
- c. FIP is transmitted through the fecal-oral mechanism, but is unique in that the virus that is spread is only capable of causing mild diarrhea. In a small proportion of infected cats, that virus can mutate to a nasty or virulent virus that we call FIP virus. The new virus is capable of spreading throughout immune cells in the body and causing the fatal disease, FIP. That virus is not shed from the body and does not infect other cats through cat to cat contact. FIP virus causes fever primarily in young adult cats, weight loss, and signs that relate to the primary organs affected. There are two forms of the disease, commonly known as the 'dry' and 'wet' forms. In the 'dry' form, there is inflammation in several organs. Involvement of the brain leads to neurologic signs like seizures, the lungs respiratory signs like trouble breathing, the liver jaundice, and the eyes uveitis, which manifests as a cloudy or discolored eye. In the 'wet' form, there is fluid accumulation in the chest, with breathing problems; fluid accumulation in the abdomen leads to abdominal enlargement. There is an intranasal vaccine for this disease but it's efficacy is controversial, and it is licensed for administration after most cats get infected with the enteric coronavirus. Dr. Niels Pedersen at UC Davis has spent most of his career researching this disease and has recently identified an antiviral drug, GS441524, that shows tremendous promise for treating this disease. Unfortunately, the drug is not commercially available and desperate owners have turned to the black market to obtain it.

9. *What evidence is there that SARS-CoV-2 can infect dogs, cats and other animals?*

Historically, there has been evidence of transmission of human respiratory viruses to dogs and cats. For example, the 2009 pandemic H1N1 influenza virus spread to a dog in New York, which developed respiratory signs, and several cats and ferrets became infected, developed respiratory signs and some even died as a result of the infection. While transmission back to humans was not clearly documented for H1N1, in 2016, an H3N7 influenza outbreak occurred in a New York municipal animal shelter in cats and there was some evidence of transmission back to 2 of the 121 workers in the shelter. Typically these influenza outbreaks that spill over to dogs and cats quickly die out and ongoing transmission is not maintained.

SARS-CoV, which appeared in 2003, was thought to have spread likely from bats to civet cats — small mammals that resemble weasels — before the first human patient was infected. Civet cats are not cats but more closely related to mongoose. However, during the SARS outbreak in Hong Kong in 2003, a small number of pet cats tested positive but none became sick. Ferrets could also get infected and develop illness. Importantly, there was no evidence of viral transmission from pet dogs or cats to humans.

MERS (Middle Eastern Respiratory Syndrome) coronavirus appeared to originate in dromedary camels and spread to humans. It appeared in 2012 in Saudi Arabia, and subsequently spread to

other countries, including a few cases reported in the United States in 2014. There was no evidence of spread of this virus to dogs and cats.

In late February and March of this year, oral and nasal samples were collected from an apparently healthy 17-year old Pomeranian in Hong Kong that lived with a person infected with SARS-CoV2 (the novel coronavirus that causes COVID-19). The samples tested weakly positive for the virus. The dog was quarantined, and subsequently, additional nasal and oral samples collected during the course of quarantine also tested weakly positive. This suggested that the dog may be infected, rather than just contaminated with the virus. It is important to note that viable ('alive') SARS-CoV-2 was not grown from the dog in Hong Kong - only RNA was identified via RT-PCR. Another dog and a cat from the same household tested negative. Subsequently, an antibody test was done on a blood sample from the dog, which was negative, suggesting that the dog had not become infected, although there can be reasons for false negatives. In addition, one major veterinary diagnostic laboratory, IDEXX, made a statement that they had tested thousands of dogs and cats using PCR and no evidence of the coronavirus was found. In mid-March, 2020, the World Health Organization stated that there is no evidence at present that dogs and cats can be infected with SARS-CoV-2, develop the disease, or spread the disease.

Two days after the dog was released from quarantine (March 17, 2020), it died suddenly. Unfortunately the owner declined a postmortem. However, because it was a 17-year old dog that showed no other signs during quarantine, there is a high likelihood that death was unrelated to coronavirus infection.

On March 19, 2020, it was announced that a second dog in Hong Kong, a 2-year old German Shepherd that lived with a person diagnosed with COVID-19, had tested positive for the virus. The dog was quarantined, in addition to a 4-year old dog from the same household, which tested negative. Neither of the dogs are showing signs of disease.

SARS-CoV-2 utilizes two receptors to enter human cells: the Angiotensin-Converting Enzyme 2 (ACE2) receptor and a type-II transmembrane serine protease (TMPRSS2) (this is similar to the original SARS virus in the early 2000s). ACE2 receptors in cats are 100% homologous to those of humans, so SARS-CoV-2 might be able to bind to ACE2 receptors in cats and ferrets. It is possible that dog receptors might also bind the virus, but the homology is lower, around 70%. However, just because a virus can bind to cells does not mean it is able to complete its replication cycle within the cell.

10. Can infected dogs and cats transmit the disease to people? Should I be taking precautions when handling dogs and cats?

Currently, no evidence exists that dogs and cats, even if infected, can transmit the SARS-CoV-2 virus to humans. No infected cats have been identified. To date, all transmission has been human-to-human, after the initial jump from bats (most likely) to humans. If dogs can shed the virus, it is possible that the quantity of virus shed is simply too low for transmission to occur, especially if there are no signs of respiratory disease to create aerosols. Considering this information in total, infectious disease experts and multiple international and domestic human

and animal health organizations (CDC, OIE, WHO) state there is no evidence at this point to indicate that pets can spread COVID-19 to other animals, including people.

Since other infectious diseases can spread between animals and humans (diseases spread from animals to humans are called zoonoses), it is prudent to always exercise good hygiene when people, especially children and the immunocompromised, are around animals. This includes washing your hands (properly) after touching, feeding or cleaning up after your pet, avoiding rough play (especially between children and animals), and not allowing pets to sleep in the bed with immunocompromised people or lick faces, wounds or healthcare devices.

If you are known to have COVID-19 (ie. through testing), or highly suspected to have it and are unable to get tested, additional special precautions are warranted. In that case, they should limit contact (ideally have someone else in the household take care of your pet) and wear a face mask. Your pet should be quarantined with you and any signs of illness in your pet should be reported to your veterinarian.

Critically, it is important not to over-react and disconnect from your pet. The importance of the human-animal bond and its positive healthcare effects cannot be overestimated. There is evidence that pet ownership has many health benefits, including reduction in mental illness and cardiovascular disease, decreased blood pressure and improved self-esteem in children. Owners should not panic about the possibility of pet infection and transmission, and instead enjoy all the positive healthcare benefits of the bond they have with their pets. On the one hand, restriction of human movement is likely to reduce adoption of pets from shelters, and more animals in need of homes may be euthanized as a result; on the other hand, we have also been aware of an increase in fostering animals by those looking for companionship during the quarantine period, which has raised concerns that these animals will not receive adequate long term care or be abandoned when quarantine is relaxed.

11. Should I (can I) test a pet for SARS-CoV-2?

Many animal diagnostic laboratories are not currently set up to test for this specific coronavirus. Some are, but are not offering testing at this time (for example, see <https://www.idexx.com/en/about-idexx/covid-19-resources/>). The problem occurs when veterinarians have to perform the testing, because they would need to wear a special high-density face mask and a face shield. Face masks have to be fitted by a trained individual in advance, and many veterinarians are not fit-tested on a regular basis, nor do they have high-density surgical masks on their inventory. Veterinarians should contact the CDC if an infected owner contacts them and requests testing of their pet.

Should your dog or cat develop respiratory illness, remember that this ('kennel cough' and 'cat flu') is extremely common in dogs and cats, especially those that board, go to 'doggy daycare' or are acquired from shelter environments. There are more than 10 different viruses and bacteria that can cause these signs in dogs, including canine respiratory coronavirus, which only infects dogs. Any pet that develops respiratory illness is much, much, MUCH more likely to be infected with a dog or cat respiratory virus or bacteria (including coronaviruses that only infect dogs, such as canine respiratory coronavirus) than the novel coronavirus. These dog and cat

viruses do not cause infections in people. Pet owners should be told to have their pet evaluated by a veterinarian if signs of runny nose/eyes, cough, or sneezing develop, and not allow their pet to contact other animals in the meantime.

12. Can I still go to the veterinarian if I am sick?

Self-quarantine is recommended if you are sick. If your animal is sick and needs veterinary attention, call them and tell them that you have or may have COVID-19. This will help the veterinarian's office take steps to keep other people from getting infected or exposed. Perhaps someone else can take your pet in.

If you are not sick, veterinarians are considered essential health services and are still offering, at the minimum, emergency care. Call your veterinarian and ask them whether they have a protocol for interacting with clients and patients during this period of social distancing. You and your veterinarian can discuss the safest approach for all concerned whether your animal needs immediate medical intervention or not. Prescriptions can be mailed, and many veterinarians are providing video consultations over platforms like Zoom or platforms especially designed for telemedicine purposes. These may require a veterinarian-client-patient-relationship to have been established through an in-person interaction and physical examination of your pet in the recent past. However, they can be suitable for recheck examinations, especially when a detailed physical examination is not necessary.

13. How can I prepare my pet for the Covid-19 pandemic?

- a) Prepare your pets, just as you prepare your family, should quarantine be required. This includes stocking up on a 2-4 week supply of food, medications (don't forget subscription medications), litter and other supplies. (The CDC offers additional information: <https://www.cdc.gov/healthypets/emergencies/index.html>)
- b) Make sure your pets' medical records, vaccines, and preventative medications (tick, flea, internal parasites) are up to date in the event you cannot care for them and need to board your pet.
- c) Practice good hygiene during interactions with your pet (e.g., wash hands before and after interacting with your pet; ensure your pet is kept well-groomed and is bathed on a weekly basis; regularly clean your pet's food and water bowls, bedding material, and toys).
- d) If you are not ill with COVID-19, you can interact with your pet as you normally would, including walking, feeding, and playing.
- e) Wash your hands before and after any contact with your pet or service animal. You should not share dishes, drinking glasses, cups, eating utensils, towels, or bedding with other people or pets in your home. Additional guidance on managing pets in homes where people are sick with COVID-19 is available from the CDC.

Biosketch

As Chief Veterinary Medical Officer, Dr. Sykes oversees all clinical and support services of the William R. Pritchard Veterinary Medical Teaching Hospital at the UC Davis School of Veterinary Medicine, one of the largest and most comprehensive veterinary medical centers in the world. A UC Davis faculty member since 2002, she previously served as Director of the hospital's Small Animal Clinic, Chief of the hospital's Small Animal Internal Medicine Service, and Biosecurity

Officer of the hospital's Small Animal Clinic. She has special expertise in infectious diseases of dogs and cats. Dr. Sykes received her veterinary degree and a PhD in veterinary microbiology from the University of Melbourne (Melbourne, Australia). She completed her residency in small animal internal medicine at the University of Minnesota and served as a clinical faculty member there before coming to UC Davis.

