Adenovirus



College of **Veterinary Medicine**

BASICS

Adenoviruses are double-stranded DNA viruses that infect all groups of vertebrates, including mammals, birds, reptiles, and fish. Most adenoviruses are species specific, but some types can infect a variety of hosts.

Adenoviruses cause a wide range of illnesses in animals and humans, with the respiratory and gastrointestinal systems most commonly affected. Adenovirus infections may be asymptomatic in hosts.

CLINICAL SIGNS of adenovirus infection vary according to the virus type and animal species infected. Red foxes infected with canine adenovirus-1 show signs of **ENCEPHALITIS** such as seizures, paralysis, coma, and death.

Skunk adenovirus affects the **RESPIRATORY SYSTEM** of a variety of animals, including porcupines, leading to nasal and ocular discharge and pneumonia.

In deer, adenovirus infection causes a **HEMORRHAGIC DISEASE** often resulting in rapid death.

TRANSMISSION of adenoviruses occurs through direct contact between infected animals or indirect contact via nasal secretions, urine, and feces. Spread may also occur through airborne routes, contaminated water, and contaminated equipment. Some avian adenoviruses can be transmitted from mother to chick through the egg.

Adenovirus infection is **DIAGNOSED** at necropsy with gross findings, histopathology with adenovirus inclusion bodies, and virus detection using PCR or virus isolation from infected tissues.

There is **NO TREATMENT** for adenoviral disease other than supportive care.

Vaccines to **PREVENT** specific adenovirus infections in domestic dogs and poultry are available. There are no vaccines to prevent adenovirus infections in wildlife species.

 The NYS Wildlife Health Program
 cwhl.vet.cornell.edu

 A partnership between NYS Dept. of Environmental Conservation and Cornell Wildlife Health Lab

DIRECT CONTACT; RESPIRATORY FLUIDS, URINE, FECES AND CONTAMINATED WATER

MANY WILDLIFE SPECIES

ALERT

HOW

WHO

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DETAILS

CANINE ADENOVIRUS-1 (CAdV-1) causes infectious hepatitis in domestic dogs, an acute illness affecting the liver and respiratory tract that often leads to sudden death. CAdV-1 can also infect wild carnivores including foxes, wolves, coyotes, bears, skunks, and raccoons. Infection in red foxes may result in liver damage and vasculitis in the central nervous system. **CLINICAL SIGNS** include anorexia, jaundice, nasal discharge, diarrhea, seizures, paralysis, coma, and death. Some infections may remain asymptomatic. Fatal infections are more common in juvenile foxes. Gray foxes may experience diarrhea, ocular discharge, and hepatitis.

SKUNK ADENOVIRUS (SkAdV-1) is unusual in that it can infect a variety of animal groups, including primates, carnivores, insectivores, and rodents. This ability to infect mammalian species that are not closely related may have implications for other wildlife species. It was first isolated from a captive pygmy marmoset that died from severe respiratory disease and was later isolated from a striped skunk in which it caused acute hepatitis and pneumonia. Infection in **PORCUPINES** affects the respiratory tract causing nasal and ocular discharge and pneumonia. Respiratory disease in infected captive African pygmy hedgehogs and a wild gray fox have also been seen.

IN DEER, Odocoileus adenovirus (OdAdV) causes <u>adenovirus hemorrhagic disease</u> (AHD) often resulting in rapid death, especially in fawns. See the disease fact sheet on AHD for details.

OTARINE ADENOVIRUS (OtAdV-1) causes diarrhea and acute hepatitis in California sea lions.

Adenovirus infections are an important source of economic loss to the poultry industry. **WILD BIRDS** generally do not exhibit illness from adenovirus infection, although respiratory disease or hepatitis may be seen in crowded captive populations. Examples of **AVIAN ADENOVIRUSES** causing disease in wild bird species held in captivity include respiratory signs in Northern Bobwhites, hepatitis in quail and pigeons, and enteritis and hepatitis in American kestrels. Wild ducks may be the source of the adenovirus that causes egg drop syndrome in domestic poultry, as supported by serologic evidence of antibodies in a variety of waterfowl species in many areas.

Adenoviruses are commonly found in captive **REPTILES**, especially bearded dragons. Infected animals may remain asymptomatic or exhibit anorexia and weight loss, weakness and abnormal postures, and sudden death. Adenoviruses have also been detected in apparently healthy wild bearded dragons in Australia.

Infected bearded dragons may remain healthy and shed the virus, potentially transmitting it to other bearded dragons. Testing of new animals for captive collections is important to prevent introduction of the virus and its spread.

PREVENTION Decreasing density among wild animals in captivity and in the wild near artificial feeding or water sources can help reduce transmission of adenoviruses. Proper disposal of deer carcasses and not moving infected, live deer to new areas is important to reduce spread of AHD.

Porcupines are an example of a species at risk for infection by skunk adenovirus due to the virus's unusual ability to infect a variety of unrelated mammalian species.

