

Canine Distemper Virus

- Canine Distemper (CD) is a highly contagious infectious disease of dogs worldwide caused by the canine distemper virus (CDV). It is often fatal.
- CD is a multisystemic disease that can present with one or more of the following:
 - Respiratory disease with severe pneumonia
 - Gastrointestinal disease with vomiting and diarrhoea
 - Neurological disease including seizures
 - Severe immunosuppression leading to infection by normally innocuous bacteria and viruses
- The most common source of infection is direct contact between the susceptible dog and infected dogs or wildlife.
- CD and canine parvovirus remain the two most important infectious diseases of dogs. CD is an important cause of death for dogs in areas where vaccination is limited (e.g. <40% of the dog population.)
- CDV vaccines provide prolonged immunity in a high percentage of dogs that receive one dose of MLV vaccine at or after 16 weeks of age. Efficacy of CDV vaccines approaches 99% and dogs develop protective immunity within a few days after vaccination.
- Ideally every dog should receive a CDV vaccine at least once when they are 16 weeks of age or older. The current vaccine provides protection against all biotypes of CDV, and antigenic variation is not a significant concern.

• CD is a vaccine preventable disease.

Conjunctivitis, nasal discharge



Photo: LE Carmichael, MJ Appel

Neurological signs, head-pressing



Photo: LE Carmichael, MJ Appel

Neurological signs, seizures



Photo: LE Carmichael, MJ Appel

Canine Adenovirus-1

- Infectious canine hepatitis (ICH) is caused by canine adenovirus type 1 (CAV-1). This highly contagious viral disease leads to mortality in approximately 20% of infected animals.
- CAV-1 infects dogs as well as wild canids such as the fox. The virus is relatively stable in the environment.
- The most common sources of virus are infected dogs and wildlife, as well as contaminated environments.
- The most common sign is acute hepatitis, but CAV-1 can also cause bleeding disorders, encephalitis, chronic hepatitis, allergic uveitis ('blue eye') and interstitial nephritis.
- This disease is rare in areas such as the USA and Western Europe where CAV-1 or CAV-2 vaccines are used in at least 40–50% of the canine population. However, where fewer dogs are vaccinated (<25%), CAV-1 remains a significant cause of disease.
- The most widely used vaccine for the prevention of ICH is a modified live virus (MLV) CAV-2 vaccine, which provides cross-protection. CAV-2 vaccines are safer because they do not cause 'blue eye' which can occur as an adverse reaction to CAV-1 MLV vaccines. Killed CAV-1 and CAV-2 vaccines are not effective, and they can cause adverse reactions.
- ICH is a vaccine preventable disease.

Allergic uveitis, "blue eye"



Photo: LE Carmichael

Petechiae, bruising, jaundice



Photo: RD Schultz, LJ Larson

Bleeding into chest cavity

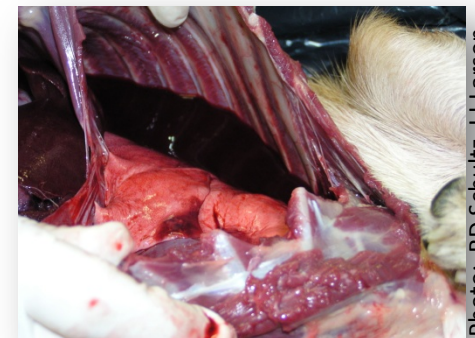


Photo: RD Schultz, LJ Larson

Canine Parvovirus

- Canine parvovirus is a highly contagious infectious disease of dogs worldwide caused by canine parvovirus type 2 (CPV-2). It is often fatal, especially in dogs infected at <1 year of age when mortality can be 50% or greater.
- Dogs with this disease most often develop severe enteritis leading to vomiting and diarrhoea that is often, but not always, bloody. Infected dogs are also frequently lethargic and anorectic. In very young (periparturient) puppies, CPV-2 can infect the heart muscle, causing myocarditis, often leading to sudden death.
- The most common source of infection is directly from an infected dog shedding virus in its faeces or CPV-2 that has contaminated the environment. CPV-2 is one of the most stable viruses in the environment, surviving for 1 year or more in soil. A facility that has housed infected dogs should be considered contaminated.
- Older susceptible dogs that become infected are less likely than pups to develop severe disease, but they do shed large amounts of virus in faeces that serve as a source of disease for younger susceptible dogs.
- Modified live virus (MLV) CPV-2 vaccines are highly efficacious, and provide prolonged immunity in a high percentage of dogs that receive at least one dose of vaccine at or after 16 weeks of age, when maternally derived antibody (MDA) has disappeared. It is strongly recommended that all dogs 16 weeks of age and older receive at least one dose of a combination MLV vaccine containing CPV-2, CDV, and CAV-2. Immunity occurs as early as 3 days post-vaccination when vaccine is given to dogs without MDA.
- Canine parvovirus is a vaccine preventable disease.

Vomiting



Photo: LE Carmichael

Inflamed gut loops

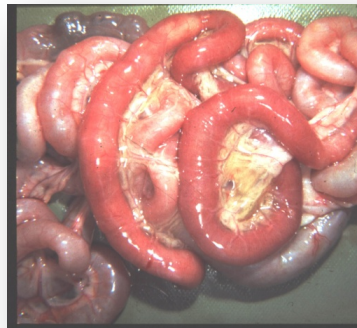


Photo: LE Carmichael

Severe bloody diarrhoea



Photo: RD Schultz, J Larson

Feline Parvovirus

- Feline Panleukopenia is a highly contagious infectious disease of cats worldwide caused by feline parvovirus (FPV).
- Cats with FPV infection develop severe enteritis leading to vomiting and diarrhoea (sometimes with blood). Virus is shed at high levels in faeces and remains infectious in the environment for at least a year.
- Unvaccinated cats of all ages can become infected. FPV infection of kittens often leads to high mortality of $\geq 50\%$. Cats older than 1 year of age develop less severe disease, with mortality $\sim 10\%$ in susceptible cats.
- Infection *in utero* often leads to abortion. Infected late term fetuses can develop cerebellar hypoplasia leading to ataxia and death.
- Both non-infectious (killed) and modified live viral (MLV) vaccines are available for parenteral administration. MLV vaccines are recommended for all except pregnant cats. When vaccination is necessary, the pregnant cat should receive killed FPV. MLV vaccine virus is capable of infecting the fetus if the queen has not been previously vaccinated.
- An intranasal MLV FPV vaccine is available, however, parenteral administration is preferred.
- When vaccine is not blocked by maternally derived antibody (MDA), FPV immunity may develop as early as 3 days post-vaccination. By the time kittens are 12–16 weeks of age, most should have lost MDA and be able to respond well to the vaccine.
- Feline Panleukopenia is a vaccine preventable disease.

Typical depressed kitten



Photo: FW Scott

Inflamed gut loops

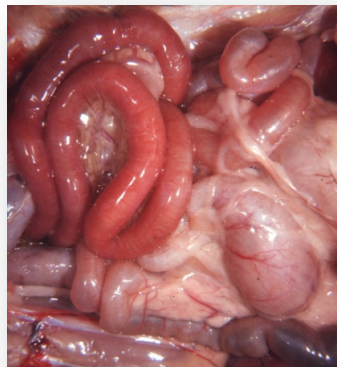


Photo: FW Scott

Profuse vomiting and diarrhoea



Photo: RD Schultz, LJ Larson

Feline Herpesvirus

- Feline herpesvirus type 1 (FHV-1) causes feline infectious respiratory disease complex (FIRDC) in combination with other viruses (especially feline calicivirus), bacteria, stress and a variety of environmental factors (e.g. poor ventilation, dust and aerosols).
- FIRDC is generally a mild, self-limiting disease in many single pet household cats. However, FIRDC can be very severe in multi-cat households, catteries and shelters, with mortality as high as 20–30%.
- Disease often presents as acute rhinitis, conjunctivitis, fever, depression and/or anorexia. Disease is often more severe in kittens <6 months of age than in adult cats.
- Infection of pregnant unvaccinated cats can lead to abortion.
- Vaccines include non-infectious (killed) and modified live virus (MLV) products for parenteral administration. An intranasal (IN) MLV vaccine is also available.
- Kittens can be vaccinated at an earlier age with the IN vaccines or the parenteral vaccines. Longer periods of time are required for killed vaccines to immunize and two doses are required, 2–4 weeks apart. The last dose of kitten vaccines should be given at 16 weeks of age or older.
- Vaccines reduce the severity of FHV-1 disease, but do not prevent infection of the cat. Latent virus can be reactivated during periods of natural stress or pregnancy, or by treatment with glucocorticoids. Immunosuppression associated with FeLV or FIV infection can also lead to FHV-1 reactivation.
- Whenever possible, non-adjuvanted vaccines should be used in cats to reduce the risk of injection site sarcoma.

Nasal discharge



Photo: FW Scott

Ocular discharge

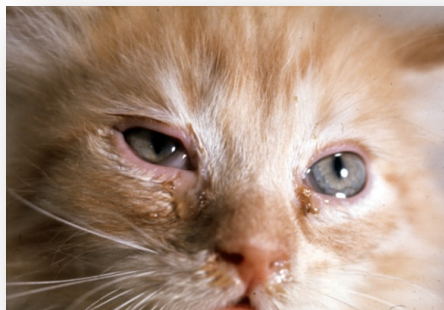


Photo: FW Scott

Severe conjunctivitis



Photo: FW Scott

Feline Calicivirus

- Feline calicivirus (FCV) leads to feline infectious respiratory disease complex (FIRDC) in combination with other viruses (especially feline herpesvirus-1), bacteria, stress and a variety of environmental factors (e.g. poor ventilation, dust and aerosols).
- FIRDC is generally a mild, self-limiting disease in many single pet household cats. However, FIRDC can be very severe in multi-cat households, catteries and shelters, with mortality as high as 20–30%.
- Infections with FCV can lead to severe disease or no disease at all, depending on the FCV variant and the age of the cat. Clinical signs may include upper respiratory disease, fever, oral ulcers and limping due to transient arthritis in a small percentage of cats. Pneumonia, when it develops, is most common in kittens.
- A rare form of virulent systemic FCV infection can occur in adult cats and is characterized by high fever, cutaneous oedema, ulcerative lesions on head and limbs, jaundice and death in 75% of affected animals. This form of disease is rare in kittens. The clinical signs suggest it may be an immune-mediated disease similar to calicivirus disease in other species.
- Kittens should be vaccinated with MLV parenteral or intranasal vaccine, with the last dose at 16 weeks of age or older. A killed parenteral vaccine is also available. All cats must receive two doses, 2–4 weeks apart, making sure that doses are given at 12 weeks and again at 16 weeks or older regardless of the number of doses given earlier. FCV vaccines do not prevent FIRDC, but they should reduce its severity.
- Whenever possible, a non-adjuvanted vaccine should be used in cats to reduce the risk of development of injection site sarcoma.

Nasal lesions



Photo: FW Scott

Oral ulcers



Photo: FW Scott

Severe pneumonia

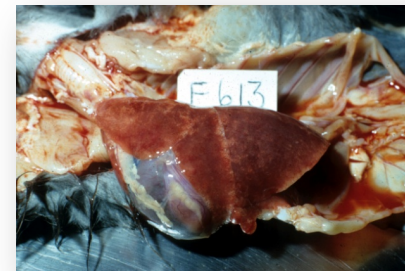


Photo: FW Scott

Rabies Virus

- Rabies is a fatal zoonotic disease of man and other mammals. The dog and cat are high risk species for the transmission of the virus to man.
- The dog is considered the primary reservoir for rabies virus. Cat-to-cat transmission is rare and most cases of feline rabies are believed to have originated from dogs or wildlife.
- Rabies virus is almost always transmitted through saliva via a bite or other skin wound.
- Cats are more resistant to some strains of rabies virus, but not all strains when compared to the dog. Also, age-related resistance to rabies is shown for the cat, but not the dog. The cat becomes a more important source of rabies virus for man where rabies is well controlled in the dog by vaccination.
- Both the dog and the cat can develop the furious (hyperexcitable) or dumb (paralysis) form of rabies. Pharyngeal and jaw paralysis is one of the cardinal signs of rabies.
- Whenever possible, non-adjuvanted rabies vaccines should be used in the cat to reduce the risk of development of injection site sarcoma. However, many countries have only adjuvanted vaccines available.
- Whenever possible, and especially in areas where rabies is prevalent, every effort must be made to vaccinate as many dogs and cats as possible with vaccines capable of providing a minimum of 3 years duration of immunity.
- Rabies is a vaccine preventable disease.

Early pharyngeal paralysis



Photo: LE Carmichael

Complete paralysis, opisthotonus



Photo: LE Carmichael

Drooling, difficult swallowing



Photo: RD Schultz, LJ Larson