



## **Liver disease in cats and dogs**

The liver is a very important organ in the body, situated beneath the last 3 or 4 ribs. It has a central role in metabolism and is involved with the synthesis, storage, detoxification and excretion of many substances.

The liver has tremendous reserve capacity as well as an ability to regenerate. These properties allow animals (and people) to stay healthy despite liver disease; however this also means that by the time liver disease makes your pet ill, there has been significant damage to the liver.

### Signs of liver disease

Because the liver has so many different functions, liver disease can produce a variety of different symptoms. These include:

- Yellowing of skin, gums and whites of the eyes (jaundice)
- A swollen, fluid-filled abdomen
- Vomiting and/or diarrhoea
- Loss of appetite
- Excessive drinking and urination
- Weight loss
- Lethargy
- Strange behaviour
- Painful abdomen

We would not expect to see all of these symptoms in one animal. Furthermore, most of these symptoms can also be signs of other diseases; they are not specific to liver disease.

### Causes of liver disease

The liver can be damaged by a number of different factors, all resulting in an inability of the liver to function effectively, and thus the development of the signs listed above.

Examples of causes of liver disease:

- Infectious disease (Feline Infectious Peritonitis virus in cats, or Canine Adenovirus in dogs; bacteria such as leptospira and salmonella)
- Parasitic disease (e.g. toxoplasmosis)
- Poisons affecting the liver (e.g. paracetamol, toxic plants, chemicals)

- Drug toxicity (e.g. some drugs used to treat epilepsy may lead to eventual liver damage)
- Congenital disease (e.g. liver shunts where the blood supply to the liver does not develop properly)
- Damage secondary to other diseases (e.g. hyperthyroidism, diabetes, heart disease can all lead to secondary liver damage if left untreated)
- Obstruction to bile flow (e.g. gallstones, inflammation of the bile duct, obstruction by an enlarged pancreas)
- Old-age progressive deterioration of the liver (“wear and tear”)
- Prolonged periods of anorexia leading to fat deposition in the liver, this is only really seen in cats and is known as hepatic lipidosis.
- Cancer of the liver
- In some cases the liver becomes inflamed and progressively damaged in the absence of any initiating cause. This is referred to as idiopathic hepatitis.
- Some breeds of dog are predisposed to liver problems (e.g. Bedlington terriers can develop copper storage disease which leads to severe liver damage; Doberman Pinscher bitches and West Highland White Terriers are also prone to developing specific types of chronic hepatitis).

### Diagnosis of liver disease

If your vet suspects liver disease blood samples will be taken from your pet to look at the levels of liver enzymes present in the bloodstream. This is a useful basic screen to detect the presence of liver damage.

Blood samples may also be taken to evaluate the levels of Bilirubin (a bile pigment), glucose and blood proteins, to assess how well the liver is functioning.

A bile acid stimulation test may be indicated in some cases to test for liver dysfunction. This involves taking a blood sample to measure the level of bile acids in the bloodstream after an overnight fast. The pet is then encouraged to eat a fatty meal and the blood sample is repeated.

X-rays and ultrasound scans are the next steps for evaluating the liver, giving an idea of the size, shape and texture of the liver and gallbladder.

Employing these tests alongside testing for other possible causes of illness will usually allow your vet to make a diagnosis of liver disease. In some cases your vet will be able to advise you on the probable cause of the liver disease, using the results of the tests detailed above and considering the age, breed and recent history of your pet. However, in many cases the only way to make a specific diagnosis of the type of liver disease your pet is suffering from is to take a liver biopsy.

A liver biopsy can be examined by a pathologist and lead to an exact diagnosis. Knowing exactly what disease process is occurring in the liver enables your vet to advise you on your pet’s prognosis and to tailor treatment specifically for your pet’s condition. However, taking a liver biopsy requires a general anaesthetic and surgery. Clearly this is an invasive procedure and it is not uncommon for owners to decide not to have a biopsy

taken from their pet. However, without a biopsy it may not be possible for your vet to know exactly what has caused your pet's liver condition and treatment will be aimed at supportive care and treating the most likely cause of their liver problem.

## Treatment

The most important treatment for animals with liver disease is to remove the cause of the liver damage. For example your vet may stop any medications he or she suspects of damaging the liver; antibiotics will be prescribed if an infectious cause of liver damage is suspected; surgery will be required for animals with congenital abnormalities in the blood vessels to the liver; anorexic cats may require tube feeding; treatment may be instituted for concurrent disease (e.g. heart conditions, diabetes); if copper-related toxicity has been proved then medications exist to displace the extra copper from the liver.

The remaining treatment options are aimed at slowing down non-specific inflammatory processes in the liver, encouraging regeneration of a damaged liver, and helping the body to cope with a liver that is not functioning normally. Your vet will advise you as to which of these treatment options are indicated in your pet's condition.

1. Fluid therapy – animals severely affected by liver disease, particularly those that are vomiting, may require a period of hospitalisation and intravenous fluids to help to flush out toxins from the bloodstream and replace fluid lost in vomiting
2. Diet –prescription diets have been formulated to provide your pet with the correct balance of carbohydrate and good-quality protein to place the least stress on the liver and achieve maximum liver regeneration. Feed little and often to help the liver still further.
3. Anti-inflammatory drugs such as prednisolone may be indicated to reduce liver inflammation
4. Even if the primary liver disease is not suspected to be infectious, some animals with liver disease will require courses of antibiotics to prevent further damage to a compromised liver
5. Ursodeoxycholic acid may be indicated to improve bile flow
6. Vitamin B supplementation (injections or tablets) is often indicated as a damaged liver is no longer able to absorb or store vitamin B in the usual way
7. Vitamin E supplementation can reduce the damage caused by inflammation within the liver.
8. Supplements containing milk thistle extract and a molecule known as S-Adenosyl Methionine (SAMe) have been developed to relieve inflammation in the liver and encourage normal function. Some of these supplements also contain vitamin B or E.
9. Medications such as lactulose may be required to reduce gut absorption of ammonia if the liver is too damaged to break it down in the usual way.
10. Zinc supplementation – zinc has been shown to reduce inflammation and to protect the liver
11. Anabolic steroids may be used to boost appetite and reduce weight loss.

## Prognosis

Treatment of hepatic disease is most likely to be successful if an underlying cause can be identified and corrected. However, the regenerative properties of the liver are such that animals with liver problems of unknown cause may still do well if supportive treatment can be provided.