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Kidney Disease

Dogs and cats, like people, have two kidneys which:

- Filter out waste products from the blood and excrete them in urine
- Regulate water and salt balance in the body
- Produce various hormones and help to control blood pressure
- Help with red blood cell production

If the kidneys cannot do these jobs properly, the level of waste products in the blood tends to rise, the body can become dehydrated easily, abnormal blood pressure may develop and, sometimes, the pet can become anaemic.

What causes kidney disease?

Many factors can be responsible for kidney damage, such as infection, genetics, severe dehydration, bladder obstruction, trauma, various toxins and cancer.

However, in most cases of kidney disease that we see, the kidney disease is a result of slow, age-related degeneration over time as the kidneys just begin to 'wear out'. We call this slow, progressive kidney disease Chronic Kidney Disease. Chronic kidney disease

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is more common in cats than dogs and as many as 50% of cats over 15 years of age have some chronic kidney disease.

The signs of kidney disease

The earliest signs of kidney disease are:

- Increased thirst (polydipsia)
- Increased urine volume (polyuria)

These signs can be more challenging to pick up in cats as many of them drink and urinate outside.

Unfortunately other signs are often not seen until more than 2/3 of the kidneys are damaged. They may include the following:

- Weight loss
- Poor hair coat
- Reduced appetite
- Recurrent bladder infections

If the kidney function reduces even further, additional signs may be seen, including:

- Further loss of appetite and weight loss
- Vomiting
- Ulcers in the mouth

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- 'Uraemic' (foul, ammonia-smelling) breath
- Lethargy and muscle weakness

How is kidney disease diagnosed?

Your vet may be suspicious from the symptoms and examination findings that your pet has kidney problems. In some cases abnormally small or large kidneys can be felt on abdominal examination depending on the size and shape of your pet.

The main tests for diagnosing kidney disease are:

- Urine testing

Poorly concentrated urine can be a sign of kidney disease. The reduced urine concentration will develop before changes occur in the blood. The urine can also be tested for infection, protein loss and blood. This is a very useful test.

- Blood tests

As the kidneys become less good at filtering the blood, the levels of waste products in the blood will rise and can be detected on a blood test. Initial tests usually check urea and creatinine levels. If these levels are high at the same time that urine and examination findings support a diagnosis of kidney disease, the diagnosis is

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made. However, urea and creatinine levels only tend to rise when around 70% of the kidneys are damaged. This means

that pets in the earlier stages of kidney disease may have normal urea and creatinine levels. If your vet suspects kidney disease, but the urea and creatinine are not high, an additional blood test can be run to measure the SDMA (symmetric dimethylarginine) level in the blood. SDMA levels tend to rise at an earlier stage in the disease (when around 40% of the kidneys are damaged) so this test is more sensitive.

Finding out the cause of kidney disease

In some cases, we do not test further to look for an underlying cause because all of the evidence already points to the kidney disease being age-related.

In other cases we will already know of a different cause (for example pets that have developed kidney disease after eating poisonous substances that are known to cause kidney damage).

However, for younger to middle-aged pets with no reason to have developed kidney disease, it is a good idea to investigate further to see if there is an underlying cause. This may involve:

- Ultrasound scan of the kidneys. The scan can check the size and shape of the kidneys, look for abnormalities in the different layers of the kidney, and detect cysts or tumours in the kidneys.
- Sending a urine sample for culture to look for infectious causes. For this test, it may be better to use a sterile urine

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sample taken directly from the bladder using a catheter or needle, than one collected in the usual way.

• Biopsy of the kidney. This is rarely recommended because it requires an anaesthetic and operation with significant risks of complication.

What happens next?

If there is an underlying cause for the kidney disease (such as infection, cancer, or toxicity), it may be possible to reverse the kidney damage by treating the underlying cause.

However, for all of the pets with slowly progressing chronic kidney disease, it is not possible to reverse or cure the condition. Instead, we need to look at ways of slowing down the kidney damage in the future, and treating any problems caused by the reduced kidney function.

An international system has been set up to standardise the way that vets monitor and manage cats and dogs with chronic kidney disease. This system is known as the IRIS staging system, and further information is available at www.iris-kidney.com. Carrying out some extra tests to 'stage' your pet's kidney disease allows your vet to create a individual package of recommendations and treatments to make your cat feel as well as possible for as long as possible.

IRIS staging

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Each pet can be put into a category, or 'stage' of chronic kidney disease, based on blood test results, with stage 1 being the earliest / mildest stage, and stage 4 the most advanced. The pet's blood pressure is measured and another urine sample is sent away for a special test to check for protein leakage (the UPC test). The blood phosphate level is also important and can usually be found on the original blood tests alongside the urea and creatinine levels.

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Once all of this information has been put together, we can classify every pet with CKD as follows: IRIS stage (recommend renal diet for stages 3 and 4; renal or 'senior' diet for stage 2)	High blood pressure? (Treat with amlodipine if blood pressure is high)	High phosphate levels? (treat with renal diet and/ or a phosphate binder if phosphate level is high)	Protein in urine? (treat with Semintra or Fortekor if UPC is high).
1	yes / no	yes/ no	yes / no
2	yes / no	yes / no	yes / no
3	yes / no	yes / no	yes / no
4	yes / no	yes / no	yes / no

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