

Understanding Kidney Disease in Cats

Kidney disease (also called renal disease) is a commonly-diagnosed condition in cats. The kidneys engage in a huge number of tasks in the body, including maintaining the proper mineral balance in the blood, conserving water, triggering the production of red blood cells, regulating blood pressure, removing numerous waste products, and producing various necessary hormones. These processes are all achieved through a very complex filtration system. When the kidneys are dysfunctional, waste products begin to accumulate in the blood stream, the proper fluid balance is not maintained, blood pressure may begin to rise, and other organ systems can be affected and begin to fail as well.

Types of Kidney Disease in Cats

There are some cat breeds, such as Persians and Angoras, which seem to have a genetic predisposition toward developing kidney disease. However, the large majority of feline renal disease cases are acquired rather than congenital. There are two main types of kidney diseases that occur in cats:

- **Acute Renal Failure (ARF)** arises when something suddenly causes damage or loss of blood supply to the kidneys, resulting in their dysfunction. The signs of illness in acute cases come on suddenly, over a period of a week to a month. The most common causes of acute kidney disease in cats are:
 - **Urinary tract blockage.** This condition is especially common in male cats. Inflammatory cells and crystals in the cat's bladder can collect to form a plug in the urethra, preventing him from urinating. Urine backs up into the kidneys, and toxins rapidly build up in the blood stream, sickening the cat.
 - **Ingestion of substances toxic to the kidneys,** especially antifreeze and certain human medications like ibuprofen, can cause acute damage to the kidneys.
- **Chronic Renal Failure (CRF)** is a long-term dysfunction of the kidneys that occurs mostly in middle-aged to older cats. When more than 75% of a cat's kidney tissue has been damaged and isn't functioning, the result is chronic kidney failure. The exact causes of CRF are not known, but it can be seen secondary to prolonged dental disease, infections, kidney stones, and many long-term inflammatory conditions. Some experts believe that the high rate of occurrence of CRF in the feline population (around 50% of cats over ten years of age) may be related to the feeding of mostly dry foods to many cats.

Signs of Kidney Disease in Cats

The most common initial sign of kidney failure in a cat is an **increase in water consumption and in the frequency and amount of urination**. In acute kidney failure, these increases may be sudden and drastic. With chronic renal failure, the changes may be more gradual and less obvious. Other signs of renal failure in cats include:

- Decreased appetite.

- Weight loss.
- Increased frequency of vomiting.
- Dehydration: the signs of this may include sunken eyes and dry or tacky mucous membranes.
- Poor hair coat due to decreased grooming.
- Foul breath due to the build-up of toxins in the blood stream.

Diagnosis of Kidney Disease in Cats

When diagnosing kidney disease, your veterinarian will take a thorough history from you to determine any signs of illness that you have been noticing in your cat at home. Then, he or she will perform a comprehensive physical examination. If kidney disease is suspected at that point, the veterinarian will order blood work and a urinalysis. Some common blood and urine tests that can aid your veterinarian in diagnosing kidney disease are:

- **Urinalysis:** A cat's kidneys usually dispose of waste material from the body while conserving as much water as possible. They are able to produce a very concentrated urine. When renal disease is present, the kidneys can't produce a concentrated urine, and the cat must drink more water in order to have enough to flush waste out of the system. The urine specific gravity test can reflect this by revealing a dilute urine. The urinalysis may also show increased protein as the kidneys begin to lose the ability to conserve it as well. Infection of the bladder or kidneys can complicate renal disease, and a urinalysis can reveal whether it is present.
- **Blood Urea Nitrogen (BUN):** BUN is a byproduct of the kidneys' breakdown of proteins. When the kidneys aren't functioning properly, this level increases in the blood.
- **Creatinine:** Another byproduct of the breakdown of proteins, creatinine is an even more sensitive test for the presence of kidney disease than BUN. As the creatinine becomes too high in a cat's bloodstream, he begins to feel sick.
- **Phosphorus:** Cats with kidney disease develop increased blood phosphorus levels (hyperphosphatemia) due to the inability of the failing kidneys to dispose of it. This causes a disturbance in the calcium-phosphorus balance in the body, resulting in the mobilization of calcium from bones in an attempt to rebalance the system. This leads to demineralization and weakness of the bones.
- **Potassium:** Low potassium levels (hypokalemia) can be associated with kidney disease in cats. It is unclear whether it is a cause or an effect of the illness, but it can result in weakness. This is especially noticeable as head and neck drooping in cats. Hypokalemia also seems to contribute to the progression of kidney disease, as well.
- **Blood Pressure:** High blood pressure (hypertension) may develop in cats with renal disease. Hypertension can cause damage to the cat's eyes, brain, and heart as it progresses. It also causes further damage to the kidneys, hastening the progression of the renal failure.
- **Hematocrit:** The hematocrit is the percentage of a cat's blood volume that is made up of red blood cells. When a cat's kidneys are failing, they do not make enough of the hormone erythropoietin, which stimulates the production of red blood cells. Because red blood cells

carry oxygen to all tissues, every system in the body is affected when there are not enough of them. A low hematocrit is associated with pale mucous membranes, weakness, and decreased appetite.

Other tests such as x-rays, ultrasound, CT scan, and kidney biopsy may be pursued in certain cases to obtain more information about a cat's kidney disease.

Staging of Renal Disease in Cats

The International Renal Interest Society (IRIS) has developed a system that is widely used for staging the severity of illness in cats with renal disease. It is based primarily on the creatinine levels in the blood, which are normally less than 1.4 milligrams/deciliter (mg/dL). The IRIS system also takes into account the cat's BUN level and the clinical signs of illness that he may be displaying. There are four stages of renal disease in this system, as follows:

- **Stage I:** Creatinine levels are less than 1.6 mg/dL in the blood. A veterinarian may feel physical changes in the kidneys during exam, and a urinalysis may show a decreased ability to concentrate urine.
- **Stage II:** Creatinine levels at this stage are between 1.6 and 2.8 mg/dL.
- **Stage III:** Creatinine levels in the blood of a cat at this stage of renal disease are between 2.9 and 5.0 mg/dL, and the BUN levels are moderately elevated. There are probably physical signs of illness at this stage.
- **Stage IV:** Blood creatinine levels of cats in stage IV renal disease are over 5.0 mg/dL, the BUN is severely elevated, and the cat is showing multiple signs of illness.

Treatment of Kidney Disease in Cats

The treatment of kidney disease in cats varies based on the individual animal's condition and test results. Common treatments include:

- **Medications for nausea.** The kidneys are responsible for producing the hormone gastrin, which triggers the release of gastric acid to aid in digestion. Cats with renal disease aren't able to shut off the production of gastrin properly, so they often have too much gastric acid, leading to nausea. Anti-nausea medications may be necessary for cats that are vomiting or those that aren't eating well.
- **Antacids.** These medications can also help counteract the extra gastric acid in the stomach.
- **Gastro-protectant medications.** Sometimes stomach-coating medications are used to protect the stomach of a cat with renal disease from the effects of increased gastric acid.
- **Appetite stimulants.** Many cats with kidney disease have poor appetites due to the toxin build-up in their systems. Appetite stimulants are sometimes necessary either long-term or intermittently to aid these cats with maintaining nutritional intake.

- **Erythropoietin injections along with oral iron supplements.** The anemia that is associated with kidney disease in cats is the result of decreased numbers of red blood cells because of lack of erythropoietin production. Injections of this hormone, along with simultaneous oral iron supplements, can help restore proper red blood cell levels in some cats. However, this product can stimulate the production of antibodies in many cats, resulting in an even greater, more dangerous anemia than they had before. This anemia usually requires blood transfusions. If erythropoietin injections are used at all, it is usually not in the early stages of kidney disease.
- **Phosphate binders.** These medications help lower the amount of phosphorus in the systems of cats with renal disease, aiding in the restoration of the calcium-phosphorus balance and alleviating many of the associated signs of illness. Regaining normal phosphorus levels has been linked with greater survival times in cats with kidney disease.
- **Potassium supplements.** Cats with renal failure may have low potassium levels. Supplementing potassium in these cats can increase their strength and quality of life. Re-establishing normal potassium levels has also been associated with improved kidney function in many cats.
- **Fluid therapy.** The cornerstone of treatment for feline kidney disease is fluid therapy. Resolving dehydration and increasing urination helps reduce the toxin build-up in the blood that results in sickness. Fluid therapy can also help restore more normal phosphorus and potassium levels, and vitamin B can be replaced through fluid therapy as well. Fluids may be given intravenously (into a vein) in the hospital during acute renal failure or when chronic renal failure is first diagnosed. Maintenance with subcutaneous (under the skin) injections at home is often used in the treatment of chronic renal failure.
- **Nutritional support.** If a cat is extremely sick when he is diagnosed with renal disease and isn't eating, aggressive types of nutritional support such as force-feeding or the placement of a stomach tube may be employed during the stabilization period.
- **Special diets.** These are usually recommended at some point in the disease progression for cats with kidney dysfunction. These diets may include some or all of the following characteristics:
 - Protein restriction.
 - Phosphate restriction.
 - Sodium restriction.
 - Canned diet to increase water consumption.
 - Home-cooked renal diet if it is balanced by a veterinary nutritionist.
- **Multivitamins.** Because cats with kidney disease may lose water-soluble vitamins, a daily multivitamin is often necessary.
- **Omega fatty acid supplementation.** These are sometimes used as part of the support of a cat with kidney disease, and they are often present in kidney formulation diets.
- **Angiotensin converting enzyme (ACE) inhibitor medications.** These medications decrease the pressure inside the kidney cells and help to reduce the loss of protein into the urine.
- **Blood pressure medication.** Blood pressure should be monitored closely in cats with kidney disease, and medications can be used if it is increased. This can slow the progression of the

kidney disease and guard against other consequences of high blood pressure such as eye, brain, and heart changes.

- **Kidney transplant.** Kidney transplants are done successfully in cats at some specialty veterinary clinics. Each program has requirements to ensure that the cat is a good candidate, and the donor cat must usually be adopted by the owner of the recipient cat. This procedure is costly and isn't done in a large number of cats.

Prevention of Kidney Disease in Cats

It probably isn't possible to prevent all kidney disease in cats. However, many cases of acute renal failure can be prevented, and some steps can be taken to decrease your cat's risk of developing chronic renal failure as well, including:

- Do not give any medications to your cat without your veterinarian's input. Many medications are toxic to cats, and the kidneys are often the primary target of such poisonings.
- Provide plenty of fresh, clean water to your cat at all times.
- It is believed by many experts that feeding canned food may decrease the risk of the development of chronic renal disease in cats.
- Provide good dental care to your cat throughout his entire life. Chronic periodontal inflammation leads to an increased risk of kidney disease in cats.
- Provide routine veterinary care to your cat. When your veterinarian has a chance to find and treat inflammatory processes before they become chronic, they have less of an opportunity to trigger chronic renal disease.

Questions to Ask Your Veterinarian if Your Cat is Diagnosed with Kidney Disease

- **Can kidney disease in cats be cured?**
 - In cases of acute renal failure, immediate and aggressive treatment can sometimes reverse the condition. Chronic kidney disease in cats can't be reversed, only managed.
- **How long will my cat live once he is diagnosed with kidney disease?**
 - This depends on the severity of the condition at the time of diagnosis and whether your cat has concurrent illnesses. The average time span for survival of cats after diagnosis of chronic renal failure is one to three years. However, some cats can live much longer than that if care is taken to treat their individual circumstances.
- **Are there holistic treatment alternatives that we can explore?**
 - **Probiotic formulations** for kidney patients are thought to help flush out the toxins present when the kidneys aren't functioning properly.
 - **Antioxidant** formulations are used in cats with kidney disease to help mitigate the damage caused by increased toxin levels in the blood.

- **Decreasing stress** in the home as much as possible may keep cats with kidney disease stable longer.
- **Kidney formulations** of natural herbs, such as ***Kidney Support Gold***, are sometimes used with success to support cats with kidney disease.
- **Acupuncture and chiropractic care** may be used as part of a holistic treatment approach in cats with renal dysfunction.

by Dr. Jan Huntingford - Monday, April 27, 2015

<http://www.petwellbeing.com/blog/cats/kidney-disease-in-cats>