



# THE WINN FELINE FOUNDATION

For the Health and Well-Being of All Cats

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## Chronic Kidney Disease

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The kidneys are very important organs with complex functions. Their main job is to filter the bloodstream and remove waste products produced during metabolism of nutrients. These waste products are eliminated from the body in urine. The kidneys also help regulate the volume and composition of blood.

One of the most common disorders of senior cats is chronic kidney (or renal) *insufficiency*. In its most severe form, it is called chronic kidney (or renal) *failure*. The term chronic renal disease (CRD) covers the entire spectrum. Cats now live much longer than in the past due to advances in nutrition and veterinary medicine. After a lifetime of wear and tear, kidney function declines as a cat ages. CRD now accounts for a significant amount of illness and death in senior cats. Fortunately, our understanding of kidney function and CRD has also increased dramatically so that more effective treatment options are available.

Each kidney is composed of thousands of individual functional units called *nephrons*. There is such an abundance of nephrons that cats can continue to live should damage or disease compromise a kidney or part of both kidneys. Throughout the cat's life, individual nephrons sustain damage from wear and tear, but enough functioning nephrons remain to provide adequate kidney function. Indeed, two-thirds or more of total kidney function must be lost before most cats will show signs of illness or changes are noted on blood tests. CRD is an ongoing, irreversible disease process that progresses over months to years.

Many signs of CRD are commonly seen in other senior cat diseases too. These include weight loss, poor appetite, lethargy, vomiting, increased thirst, and increased urination. Diseases such as diabetes mellitus and hyperthyroidism may have similar signs so that diagnostic tests are required to differentiate them. As CRD advances, other signs may appear, such as ulcers in the mouth and bad breath produced by toxic levels of waste products (uremia). Severe weight loss, dehydration, and low blood potassium levels (hypokalemia) can contribute to debilitation and weakness. As well, the kidneys produce a hormone called erythropoietin that stimulates the bone marrow to make new red blood cells to replace older damaged ones. In some cats with CRD, erythropoietin levels may fall, the bone marrow may decrease its production of red blood cells, and anemia may result. Anemia further contributes to weakness and general debilitation. Finally, the kidneys play a role in regulating blood pressure so that about 1 in 5 cats with CRD will develop high blood pressure (hypertension).

If your senior cat has signs of illness that might indicate CRD, your veterinarian will perform a complete physical examination as well as a blood pressure measurement. When the abdomen of a cat with CRD is palpated, the kidneys are small in size and their surfaces may be lumpy instead of smooth. Painful ulcers may be found in the mouth,

which contribute to a poor appetite. The hair coat may be dry and unkempt due to decreased grooming behavior. Many CRD patients are dehydrated and may also suffer from constipation. Cats with hypertension may be lethargic, may have behavior changes (especially vocalizing at inappropriate times), and may suffer damage to the retinas that can result in sudden blindness. An unfortunate few will suffer neurologic disease similar to a stroke.

Laboratory testing for CRD includes blood chemistries, a urinalysis, and a complete blood count. Problems such as anemia, hypokalemia, high phosphorus levels (hyperphosphatemia), and increased amounts of blood urea nitrogen (BUN) and creatinine are associated with CRD. A urinalysis may reveal dilute urine (low urine specific gravity), a urinary tract infection, and significant protein in the urine (proteinuria). Since hyperthyroidism is also a common disease in senior cats, a blood thyroxine level (total T4) should be checked. It is not uncommon to find senior cats with more than one age-associated illness.

Once your cat's health status is fully known, a treatment plan can be devised. Wherever possible, senior cats are best treated on an outpatient basis. However, some cats with CRD are in need of hospitalization for rehydration with intravenous fluids, correction of metabolic imbalances, and sometimes tube feeding. Many cats improve markedly when their dehydration is corrected and nutrition is supplied. In some cases, several days of treatment with intravenous fluids can help lower the levels of waste products in the bloodstream (this is called diuresis). While dialysis is commonly available for human patients with CRD, it is not commonly available for cats.

The International Renal Interest Society (IRIS; [www.iris-kidney.com](http://www.iris-kidney.com)) has established guidelines for staging cats with CRD. There are 4 stages of CRD based on creatinine levels, and each stage has its own set of therapy recommendations. Dietary therapy plays an important role in the treatment of CRD patients, but may not be started until late stage 2. Many companies make special diets for kidney disease, in both canned and dry versions that are low in protein (to reduce the kidney's workload), low in phosphorus, higher in potassium and higher in calories. Some CRD patients with low potassium levels will benefit from daily potassium supplementation. This can be done in pill form or in a powder that can be mixed into canned food.

Other medications that might be prescribed include: phosphate-binders such as aluminum hydroxide to reduce phosphorus intake, appetite stimulants such as cyproheptadine or mirtazapine, acid-blockers such as famotidine to reduce nausea and improve appetite, and medications such as amlodipine to control hypertension. If anemia is severe, synthetic forms of human erythropoietin can be given by injection. Correction of severe anemia often results in the patient having more energy and feeling better overall. Newer therapeutic options include calcitriol (a drug that reverses some of the metabolic changes associated with calcium and phosphorus imbalances) and benazepril (a drug prescribed for CRD patients with significant amounts of protein in the urine).

While most cats with CRD are drinking increased amounts of water, they still may not drink enough to supply their requirements. Improving fluid intake helps prevent dehydration and improves kidney function. For this reason, canned food is preferred over dry food. Another method of increasing fluid intake is the use of subcutaneous fluid therapy. It can have a profound impact on the cat's health status and improve quality of life. Your veterinarian can teach you how to perform this simple but very helpful procedure at home on a regular basis.

Cats with CRD need frequent monitoring by a veterinarian. Uncomplicated cases with mild to moderate disease may only need to be re-evaluated every 1 to 3 months.

More advanced cases with complications may require very frequent monitoring. Some medications, such as synthetic erythropoietin, initially require weekly monitoring. Cats taking medications for hypertension may also require more frequent monitoring. Repeat blood testing at intervals will help to judge the success of any treatments and allow for any adjustments that might be needed. Owners are also encouraged to monitor thirst, urination, appetite, weight, and the cat's overall quality of life. Many cats with CRD will eventually be euthanized when their disease becomes intractable and their quality of life becomes poor. Good communication between you and your veterinarian can help determine when this time has come.

Obviously, the amount of care a CRD patient needs depends on the severity of the disease and whether complications such as anemia and hypertension are present. In many cats, CRD progresses slowly, allowing time to improve quality of life without too much intervention. In other cats, the disease may not be recognized until it is quite severe, in which case more intensive treatment will be needed. The earlier in the course of the disease it is diagnosed and treated, the better the prognosis. One way to detect kidney disease early is to use routine blood screening for cats over the age of 8 years. Many veterinarians offer these services for senior cats as part of their annual wellness examination and before any procedures that require anesthesia (such as dental cleanings).