



WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • www.winnfelinefoundation.org
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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 kidney disease (CKD) covers the entire spectrum from mild to severe disease. Cats now live much longer than in the past due to advances in nutrition and veterinary medicine. While the underlying causes of CKD are not fully understood, after a lifetime of wear and tear, kidney function declines as a cat ages. CKD now accounts for a significant amount of illness and death in senior cats. Fortunately, our understanding of kidney function and CKD has also increased dramatically so that more effective treatment options are available.

Each kidney is composed of hundreds 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 most blood or urine tests. CKD is an ongoing, irreversible disease process that progresses over months to years.

Many signs of CKD 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 diagnostic tests are required to differentiate them. As CKD 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 CKD, 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 CKD will develop high blood pressure (hypertension).

If your senior cat has signs of illness that might indicate CKD, your veterinarian will perform a complete physical examination as well as a blood pressure measurement. When the abdomen of a cat with CKD is palpated, the kidneys are often 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

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unkempt due to decreased grooming behavior. Many CKD 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 CKD includes blood chemistries, a urinalysis, and a complete blood count. Problems such as anemia, hypokalemia (low potassium level), high phosphorus levels (hyperphosphatemia), and increased concentrations of blood urea nitrogen (BUN) and creatinine are associated with CKD. A new test has recently become available for cats called Symmetrical Dimethylarginine (SDMA) that may allow earlier detection and more accurate staging of CKD. A urinalysis may reveal dilute urine (low urine specific gravity), a urinary tract infection, or significant protein in the urine (proteinuria). Quantifying proteinuria usually requires a special urine test called a “Urine Protein/Creatinine Ratio” (UP/C). 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 CKD are in need of hospitalization for rehydration with intravenous fluids, correction of metabolic imbalances, and sometimes assisted 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 CKD, it is not commonly available for cats.

The International Renal Interest Society (IRIS; www.iris-kidney.com) has established guidelines for staging cats with CKD. There are 4 stages of CKD based on blood creatinine and SDMA levels, and each stage has its own set of therapy recommendations. Several substages also exist which may alter treatment plans and prognosis. Full workup of renal disease involves blood tests, urine tests (including UP/C), and blood pressure evaluation.

Dietary therapy plays an important role in the treatment of CKD patients. Several diets are available for cats with various stages of CKD 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. Omega-3 fatty acids are also often supplemented. Some CKD 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. Canned food is often recommended for cats with CKD as it allows increase fluid intake, correcting dehydration.

The role of dietary protein in CKD is currently a topic of intensive debate in veterinary medicine. While there is significant data suggesting that protein restriction increases survival in cats with renal disease, it is also well known that muscle wasting presents a quality of life issue. The key seems to be ensuring cats eat enough calories and protein to meet their nutrition requirements. A topic that should be discussed with your

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veterinarian is finding the correct balance between preserving muscle mass and adequate calories while also minimizing dietary protein.

Several other medications are often prescribed to cats with CKD. Phosphate-binders such as aluminum hydroxide or chitosan may be used to reduce phosphorus intake. Appetite stimulants such as mirtazapine (or less commonly cyproheptadine) can help to ensure proper caloric intake. Stomach acid-blockers such as omeprazole or anti-nausea medications such as maropitant may be used to reduce nausea and improve appetite. Amlodipine is commonly used to reduce high blood pressure.

For patients with increased levels of protein in their urine, benazepril is often prescribed to control disease and potentially reduce urine protein levels. Proteinuria has been shown to be associated with a poorer prognosis for survival. A newer drug called telmisartan is also used for decreasing proteinuria and may be more effective than benazepril in the long term. Early research suggests that telmisartan may also be effective at blood pressure control in some situations.

If anemia is severe, synthetic forms of human erythropoietin can be given by injection, accompanied by iron supplementation (usually also by injection). Correction of severe anemia often results in the patient having more energy and feeling better overall. Other therapeutic options include calcitriol; a drug that reverses some of the metabolic changes associated with calcium and phosphorus imbalances. While this has been used for some time to treat cats with CKD, there is considerable debate as to its efficacy and it is not usually a first line treatment.

Some experimental treatment options have been investigated in cats with CKD. While renal transplantation is done in some centers, it is cost prohibitive and has ethical concerns associated with it. Stem cell therapy for regenerating renal function is currently being investigated.

While most cats with CKD 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 (administering a sterile saline solution under your cat's skin with a needle). This can have a profound impact on the cat's health status and improve quality of life. Your veterinary can teach you how to perform this simple but very helpful procedure at home on a regular basis.

Cats with CKD 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 or concurrent disease 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 and urine 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 CKD will

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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.

The amount of care a CKD patient needs depends on the severity of the disease and whether complications such as anemia and hypertension are present. In many cats, CKD 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).

For more information:

Veterinary Partner:

<http://www.veterinarypartner.com/Content.plx?A=572>

Cornell Feline Health Center:

http://www.vet.cornell.edu/fhc/Health_Information/kidneydisease.cfm

American Association of Feline Practitioners

<http://www.catvets.com/cat-owners/cat-owners/disease-and-conditions/chronic-renal-disease>

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