



Cornell Feline Health Center

Supporting Cat Health with Information and Health Studies.

[CVM](#) > [Departments, Centers and Institutes](#) > [Cornell Feline Health Center](#) > [Health Information](#) > [Feline Health Topics](#) >

Chronic Kidney Disease

Chronic kidney disease (CKD) is the persistent loss of kidney function over time. Healthy kidneys perform many important functions, most notably filtering the blood and making urine, so problems with kidney function can result in a variety of health problems for a cat. Among the many different kidney diseases that may affect cats, CKD is the most common.

The kidneys are part of the renal system (Figure 1), the body's system for filtering impurities out of the blood. Urine produced in the kidneys is carried to the bladder by the ureters and from the urinary bladder to the outside world by the urethra.

Clinical Signs

Cats with CKD may experience a buildup of the waste products and other compounds in the bloodstream that are normally removed or regulated by the kidneys. This accumulation may make them feel ill and appear lethargic, unkempt, and lose weight. They may also lose the ability to concentrate their urine appropriately, and as a result they may urinate greater volumes and drink more water to compensate. The loss of important proteins and vitamins in their urine may contribute to abnormal metabolism and loss of appetite. They may also experience elevated [blood pressure \(hypertension\)](#), which can affect the function of a number of important systems, including the eyes, brain, and heart.

Another cause of lethargy in cats with CKD is the buildup of acids in their blood. The kidneys of cats with CKD may not excrete these compounds appropriately, making affected cats prone to blood acidification, or acidosis, a condition that can significantly affect the function of a variety of organ systems in the body. CKD may also decrease a cat's ability to produce red blood cells, which can lead to [anemia](#), a reduced concentration of red blood cells in their blood. This may cause their gums to appear pale pink, or in severe cases, whitish in color, and may make them lethargic.

Diagnosis

To evaluate kidney function, veterinarians will most often turn to blood tests and urine analysis (urinalysis) to evaluate the concentrations of waste products and other components that healthy kidneys normally filter or regulate.

Blood tests can determine the concentration of two important waste products: blood urea nitrogen (BUN) and creatinine, but creatinine is generally recognized as a more specific indicator of kidney function. An increase in the concentration of these compounds in your cat's blood may suggest that his kidneys are not functioning properly, although these values must be interpreted in light of a number of factors. Dehydration, for example, can cause BUN and creatinine concentrations to increase in spite of the fact that a cat's kidneys are functioning normally. Ideally, a veterinarian will base his or her interpretation of kidney function on at least two blood samples, obtained within two weeks of one another, from a normally hydrated cat that has fasted for 12-24 hours. The concentrations of other blood components, including various electrolytes (like sodium and potassium), phosphorus, red blood cells, and proteins are also important to evaluate in a cat being examined for CKD.

Suggested Articles

[Bladder and Kidney Stones](#)

[Hypertension](#)

[Polycystic Kidney Disease](#)

[Renal Amyloidosis](#)

[Video: Cat Owner's Guide to Kidney Disease](#)

[The Special Needs of the Senior Cat](#)

[Poisons](#)

[When Kitty Needs a Dentist](#)

*Recently, a new test measuring the concentration of symmetric dimethyl arginine (SDMA), a waste product of protein metabolism, has been used as a way to detect chronic kidney disease earlier than previously available tests. While further studies are required to determine whether early intervention based upon SDMA testing will translate into improved outcomes for cats with chronic kidney disease, there is evidence to suggest that they might, providing hope for longer and higher quality lives for cats with CKD.

In a urinalysis, your veterinarian will consider the concentration of the urine, its pH, and the presence of protein, blood cells, bacteria, and other cells that generally should not be found in feline urine, all of which provide important information regarding the health of a cat's kidneys. It is also important to culture a urine sample to rule out the possibility of bacterial infection of the urinary tract in suspected cases of CKD. Urine samples may be obtained either by collection from a litter box filled with non-absorbent beads designed for this purpose, by catheterization of the urethra (the opening of the urinary tract to the outside world), or by cystocentesis, a technique that extracts a urine sample by passing a very fine needle through the abdominal wall into the bladder. Cystocentesis is generally considered a safe procedure and in most cases will provide the most diagnostically useful sample for analysis.

Other studies that can be useful in evaluating a cat with suspected CKD include imaging studies such as abdominal ultrasound, radiographs (X-rays), and, in some cases, microscopic evaluation of biopsy samples. Given the potential for hypertension in cats with CKD, measurement of a cat's blood pressure is also an important part of the medical evaluation for this disease.

Treatment

Although there is no definitive cure for CKD, treatment can improve and prolong the lives of cats with this disease. Therapy is geared toward minimizing the buildup of toxic waste products in the bloodstream, maintaining adequate hydration, addressing disturbances in electrolyte concentration, supporting appropriate nutrition, controlling blood pressure, and slowing the progression of kidney disease.

Dietary modification is an important and proven aspect of CKD treatment. Studies suggest that therapeutic diets that are restricted in protein, phosphorus and sodium content and high in water-soluble vitamins, fiber, and antioxidant concentrations may prolong life and improve quality of life in cats with CKD. However, many cats have difficulty accepting therapeutic diets, so owners must be patient and dedicated to sticking to the plan. It is important to make a gradual transition to a therapeutic diet and to consider food temperature, texture, and flavor. Cats with CKD that go without food for relatively short periods of time may develop significant health problems, so it is crucial to make sure that your cat is eating during a transition to a therapeutic diet.

Controlling hypertension, decreasing urinary protein loss, and addressing anemia are important therapeutic goals in cats that develop these conditions. Hypertension is usually controlled with oral medication, and urinary protein loss may be treated with angiotensin converting enzyme inhibitors. Anemia in a cat with CKD may be treated by replacement therapy with erythropoietin (or with related compounds), which stimulates red blood cell production. Cats with CKD may produce less erythropoietin, and there is some evidence that replacement therapy can increase red blood cell counts. In some cases, blood transfusions, which may be used to restore normal red blood cell concentrations using blood obtained from a donor cat, may be necessary.

Although a number of other therapies, including phosphate binders, potassium supplementation, antioxidant supplementation, alkalization therapy, and administration of fluids either intravenously or subcutaneously, have the potential to help cats with CKD, these approaches have not been fully validated, and controlled studies are needed to determine whether they offer any benefits. The same is true of hemodialysis (the removal of toxic waste products from the bloodstream by specially designed equipment) and kidney transplantation. These controversial, complex, and expensive treatments offer potential benefits to cats with CKD, but they have not been subjected to studies to prove their effectiveness, so they should be explored with the careful guidance of a veterinary specialist.

Prognosis

Some cats respond very well to treatment for CKD while others do not, so the prognosis for CKD in affected cats is quite variable. Some studies suggest that cats that lose more protein in their urine have less favorable prognoses. There is evidence suggesting that the earlier CKD is diagnosed and treatment is initiated, the better the outcome with respect to quality of life and survival.

Updated June 2014

**Added March 2019*

