

Chronic Renal Failure in Cats

Also known as CRF or Kidney Disease

What do my cat's kidneys do?

The kidneys have many functions. They principally act to remove protein waste products from the blood stream, retain essential nutrients such as potassium and protein at the correct levels, maintain hydration, and remove waste in urine. They also help regulate red blood cell production, blood pressure and body temperature.

What is chronic renal failure?

The kidneys have a large amount of spare capacity to perform their various functions so at least 66% of both kidneys need to be dysfunctional before clinical signs are seen. In many cases this means that the damage to the kidneys has been occurring over a number of months or years (chronic) before failure is evident. Chronic renal failure (CRF) is most commonly seen in older cats (10% of cases occur in cats less than 3 years old). Early signs of disease such as weight loss and poor coat quality are often dismissed as normal aging changes. Other signs such as drinking and urinating a lot mislead owners into believing that their cats must be well hydrated and their kidneys must be working. In fact, it is the complete opposite. In CRF, no matter how much water the cat drinks, the cat does not make up the difference. The losses are bigger and leaves the cat in a constant state of dehydration. This is what drives your cat's excessive thirst. In the initial stages of kidney disease, the kidneys cope with their inability to concentrate waste products by excreting them at a lower concentration, over a larger volume. This is known as compensated renal failure. After approximately 66% of the kidney tissues are destroyed, there is a rapid rise in waste products in the bloodstream and a gradual onset of disease.

What are the causes of CRF?

A large number of different disease processes can eventually lead to CRF, including:

1. Congenital malformations of the kidneys - e.g. polycystic kidneys in certain breeds of cats
2. Bacterial kidney infections (pyelonephritis)
3. Glomerulonephritis - damage (from drugs, toxins, inflammatory diseases, etc.) to the filtration unit of the kidney
4. Neoplasia - various tumors of the kidney, most commonly lymphosarcoma
5. Amyloidosis - this is the build-up of an unusual protein in the kidney that prevents the kidney from functioning normally
6. Viral infections such as feline leukemia virus or feline infectious peritonitis virus.
7. Genetics – this is the most common cause of CRF.

CRF is the end stage of a number of different disease processes rather than a specific condition in its own right. It is also *the most common geriatric disease* we see in our feline companions.

How is the disease diagnosed?

Renal failure is usually diagnosed by looking at the level of two waste products in the bloodstream, blood urea nitrogen (BUN) and creatinine and the urine specific gravity. Tests to measure the blood levels of other substances (e.g. potassium, phosphorus and calcium), as well as the red and white blood cell counts can also be important in order to determine the best course of treatment.

Could the renal failure have been diagnosed earlier?

Unfortunately, this is very difficult as neither clinical signs of renal failure, nor rises in BUN and creatinine are evident until significant loss of kidney function has occurred. In earlier stages of disease, there are no clinical signs to indicate that sophisticated renal function tests, which can pick up early renal damage, are required. We recommend that all senior pets have at least annual blood chemistry profiles, including BUN and creatinine, and a urinalysis to diagnose kidney disease at its earliest detectable level. A low urine specific gravity may indicate that at least two-thirds of the kidney tissues are damaged. An inappropriately low urine specific gravity is often the first sign seen.

How does CRF affect my cat?

Because the kidneys perform a variety of different functions, the clinical signs of renal failure can be somewhat variable. The most common changes seen are increased thirst and urination, weight loss, poor hair quality, halitosis (bad breath), variable appetite which may be associated with mouth ulcers, vomiting, lethargy and depression. Sometimes renal failure is seen as sudden onset blindness which is secondary to high blood pressure. High blood pressure can cause cats to act in ways we would refer to as cranky, easily agitated, or aggressive towards people, especially children, and/or other animals. Illness, pain or discomfort from any source/cause often triggers cats to act out of their ordinary routine. They may hide, be less social, have different eating habits as described above, and/or different elimination habits which often means not using their litterbox to urinate and/or defecate. They may also feel too weak to get to their litterbox, food and/or water.

What treatments are available? Depending on the results of blood tests, your veterinarian may be faced with several problems that require different treatments. Don't worry if the list below seems so long that you will never be able to administer all of the medications. The majority of cats can be effectively managed with diet change, including supplementation and one or two other treatments.

1. Lowering the level of waste products in the bloodstream by feeding lower, high quality protein and low phosphorus diets. We carry three different brands of kidney diets. The canned is more beneficial because it adds more water to your cat's diet, but both canned and dry should be offered daily. Your cat should be allowed to eat as much of these diets as he/she wants. It is more important that your cat eats, so if he/she won't eat one of these diets, then feed your cat whatever he/she will eat. If you have multiple cats with different dietary needs, we can help simplify feeding so that all their nutritional requirements are met. Diet management of renal disease is often the primary therapy for early stage disease. A low phosphorus diet is ideal. There are diets specifically made for renal disease. These diet's include Hill's Science Diet K/D, Purina NF, and Renal LP and Modified by Royal Canin. the Cat Clinic of Roswell carries all of these diets. Unfortunately, once the phosphorus level is

decreased, the protein content will be lower and palatability will suffer. Above all priorities with feline kidney disease, eating well every day will serve every patient well. Canned food provides hydration benefits and allows for more objective monitoring of the cat's appetite. The canned food diets made for kidney disease should be offered to the renal patient. However, if the cat finds these diets unacceptable, we would recommend you continue the search for a palatable canned food. Ideally, every renal patient eats 5-6 ounces of canned food every day. Royal Canin, Hill's Science Diet, and Purina renal diets should be fed in dry and canned form to every renal patient. The dry food is usually palatable in most cases. If the cat will also eat the canned food well, reaching the 5 ounces per day goal, dietary modification of renal disease will be complete. The hydration benefit of canned food, even if not made for kidney disease, is significant. If your cat finds the renal diets unacceptable in the canned form, search for a canned diet that they will eat well enough to reach the daily goal of 5 ounces minimum. The most important nutritional goal for a renal patient is that the cat eats well every day. You can also use the renal diets to compare nutritional profiles to retail food. Particularly, Purina's retail diets (Fancy Feast, Friskies) will compare favorably to the renal diet's nutritional profile. Cats often find these diets significantly more palatable.

2. Subcutaneous (SQ or Sub Q) fluids – Since dialysis is not readily available, economical or convenient in veterinary medicine, we have to flush the body of the waste products in the blood by giving SQ fluids. If this becomes necessary for your cat, we will teach you how to administer these at home to your cat on a daily, to every other day basis. Because we deal only with cats, we have lots of tips and tricks on how to make this treatment go smoothly and successfully. Alternatively, once you purchase the fluids, you can bring them and your cat to us, so that we can give them for you while you wait. The process takes only 5 minutes and, like everything, gets easier to do with practice. Once you see how much better they make your cat feel, you will be glad you learned how to do this simple treatment for your feline companion. The amount and frequency of fluid administration will be adjusted over time based on recheck evaluations of your cats BUN, creatinine, phosphorus, and electrolytes.

We will show you how to administer the fluids and how to prepare the bag. Attach the IV line to the bag as demonstrated. Remember that both ends of the line are sterile; don't touch them or let them fall. Attach the needle to the end of the line. Hang the bag as high as you can (you can use a coat hanger or some other kind of hook). Squeeze the reservoir until it is half full of fluids. If you squeeze too much, turn the bag upside-down and squeeze the reservoir until it is half full again. Run a stream of fluids through the line to remove all the air from the line. You are now ready to administer subcutaneous fluids to your cat.

Each number on the bag represents 100 mL. Before you start giving the fluids, look at the amount of fluids left in the bag to determine where you should stop. For example, the level is at 300mL and your cat gets 150mL every day. Start giving the fluids and stop the flow when the level of fluids gets down to the mark between 4 and 5 (in other words, down to the 450mL level). Note: From the 9 to the bottom of the bag equals 100mL.

Position the cat on a table or countertop. On one side of the cat, in front of the hip, pull out a pocket of skin. Insert the needle into the skin pocket. Make sure it is inserted PARALLEL to the cat, not pointed towards his body. Also make sure the tip

of the needle is pointed TOWARDS his head; that way, if something spooks him and he runs away, the needle will just pull out instead of getting caught in and tearing the skin. Spin the roller on the flow control mechanism up with your thumb to start the flow of fluids. As you administer the fluids, look at the reservoir to make sure the fluids are flowing strong and not just dripping slowly. If it is just dripping, pull the skin forward, out from the needle slightly, as the skin may be lying against the end of the needle, preventing a steady flow. If that doesn't increase the flow, check that the line is not crimped at the point of the flow control mechanism.

After the correct amount of fluids have been administered, turn off the flow by spinning the roller on the flow control mechanism down with your thumb. Then pull out the needle. You can pinch the skin slightly at the needle entry point in order to prevent a large amount of leakage. However, leakage will occur anyway before the skin seals itself back up; don't be alarmed, as this is normal. You may also see some blood or blood tinged fluid leak out. This is also normal as you may have nicked a tiny vessel in the skin. This too will heal up quickly on its own and there is no reason to be alarmed. Put a fresh, new, sterile needle on the IV line, give your cat a kiss, and you're done until next time!

Many people administer fluids in the bathroom because the countertop is at a convenient level, they can hang the bag from the shower hooks or even on a hook from the ceiling, and they can close the door. To make the experience more pleasant for your cat, feed your cat canned food while he's getting fluids. He will associate the procedure with something positive and you won't have to search for him when it's fluid time! Alternate on which side of the cat the fluids are given, if possible. You can also administer the fluids in the scruff of the neck. This is convenient when the cat is squirmy and there is no one to help you hold your cat. Ask the technician to demonstrate this method. Another trick that has worked is to warm the fluids by immersing the bag in hot water. It is EXTREMELY IMPORTANT that you test the temperature of the fluids on your skin before administering, to avoid scalding your cat.

IMPORTANT

If your cat is due for fluids and you notice the fluids from the last treatment have not been absorbed, do not give more fluids! Call our office for instructions from the veterinarian.

3. Antibiotics - these may be beneficial if your cat has a urinary tract infection. A urinary tract infection may be diagnosed by culturing the urine..
4. Potassium supplementation - cats in renal failure tend to lose too much potassium in the urine. This leads to muscle weakness, stiffness and poor hair quality. Low potassium levels may also contribute to the worsening of the kidney failure. This may not be evident initially, either in the bloodwork or by the way your cat acts. Often it may occur once SQ fluids are begun, so potassium levels will be checked regularly after SQ fluids are given on a steady basis. There are a few ways to supplement potassium, either in their SQ fluids as well as orally with a liquid, gel, or tablet form.
5. Anti-emetics - for those cats that are experiencing vomiting, the use of anti-emetics reduces nausea, thereby improving appetite. We often recommend Pepcid AC as directed by the veterinarian. This is available without a prescription from any local pharmacy. Do not use Pepcid Complete or any variety of Pepcid other than Pepcid AC. We will instruct you on how much and how often to give this medication, if your cat needs it.

6. Blood pressure medication - significant numbers of cats with kidney failure have high blood pressure. Sometimes we see the blood pressure rise before we see the BUN and/or creatinine elevate. Lowering these cats's blood pressure not only helps them feel better, but also protects the kidneys from the damage that high blood pressure can cause. Alternatively, blood pressure may be low (due to dehydration) to normal at the time of diagnosis. If and when SQ fluids are added to the treatment regimen, blood pressure may rise and become too high. For these reasons we will often recommend blood pressure be rechecked even if it is found to be normal initially. This is a human medication and can be obtained from any pharmacy, as well as ours. We will be happy to call the prescription into your local pharmacy. For those who have an easier time giving liquid medications, we can compound this pill.
7. Treatment of anemia - the kidneys also initiate the production of red blood cells in the bone marrow. Many cats with CRF are anemic due to a lack of stimulation of the bone marrow. This can make them feel weak, lethargic and inappetent. Like low potassium, this is often not apparent until after the initiation of SQ fluids. We have medication that you can give your cat to help stimulate bone marrow production, if your cat becomes anemic.
8. Treatment of low body temperature - cats with advanced CRF can have difficulty keeping their body temperature up to normal. Providing them with soft bedding in a warm, sunny location is helpful. We carry a product called Snuggle Safe that provides hours of warmth without needing electricity.

IT IS IMPORTANT THAT FRESH WATER IS AVAILABLE AT ALL TIMES BECAUSE CATS WITH RENAL FAILURE TEND TO DEHYDRATE RAPIDLY.

Since these cats experience an increased urgency to urinate large volumes, it is also important to provide additional large litterboxes in several locations throughout your home. It is also helpful to provide extra food dishes to make it easier for them to eat.

How long can I expect my cat to live?

Most cases of CRF advance very slowly, especially when caught early. With treatment and regular rechecks as prescribed by your veterinarian, your cat can have many years of good quality, active life ahead. Often, after approximately six months of SQ fluid treatment, the remaining normal kidney tissue can hypertrophy, or enlarge, and essentially compensate to some extent for the damaged kidney tissue. The best prognosis is with early detection, and intervention with appropriate treatments recommended by your veterinarian. We recommend all cats begin to be screened for kidney and other common geriatric diseases annually, starting at 10 years of age, or 8 years for purebred cats.

This client information sheet is based on material written by Ernest E. Ward Jr., DVM.
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