

UNIVERSITY VETERINARY HOSPITAL & DIAGNOSTIC CENTER

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CHRONIC KIDNEY INSUFFICIENCY IN CATS

By definition, kidney insufficiency or failure is the inability of the kidneys to remove waste products from the blood. This definition can occasionally create confusion because some will equate kidney failure with failure to make urine. Kidney failure is NOT the inability to make urine; it is the inability of the kidneys to remove toxic and waste products from the blood. Ironically, most cats in kidney insufficiency are actually producing large quantities of urine, but the body's wastes are not being effectively eliminated. Most cats are better described as having kidney insufficiency rather than kidney failure.

Chronic kidney insufficiency occurs when approximately 75% of kidney function is lost. At birth, kidneys have a large number of cells, and slowly lose them throughout life due to many causes. No new cells are every produced.

Is age a factor?

Many forms of chronic kidney insufficiency are the end result of infections or toxins damaging the kidneys. However, the typical form of chronic kidney insufficiency is the result of aging; it is simply a "wearing out" process. For most cats, the early signs occur at about 10-14 years of age.

How does it affect my cat?

The kidneys are essentially filters through which the blood flows for cleansing. When disease or aging causes the filtration process to become inefficient and ineffective, blood flow to the kidneys is increased in an attempt to increase filtration. This results in the production of more urine. To keep the cat from becoming dehydrated due to increased fluid loss in the urine, thirst is increased; this results in more water consumption. Thus, the early clinical signs of kidney insufficiency are increased water consumption and increased urine production. The clinical signs of more advanced kidney failure include loss of appetite, depression, vomiting, diarrhea, weight loss, lethargy, or very bad breath. Occasionally, ulcers will be found in the mouth.

How is the diagnosis made?

The diagnosis of kidney insufficiency is made by determining the level of two waste products in the blood: blood urea nitrogen (BUN) and blood creatinine. A urinalysis is also needed to complete the study of kidney function and evaluate for the presence of an infection.

Although BUN and creatinine levels reflect kidney insufficiency, they do not predict what will happen tomorrow or next week. A cat with marginal kidney function may have normal blood tests. If that cat is stressed with major illness or surgery, the kidneys may fail, sending the blood test values up quickly.

How is kidney insufficiency treated?

The goal of treatment is to restore function of the kidneys. But, we must recognize that your cat's kidneys have reached this point due to long-standing disease or aging; therefore, they will never be normal again. However, many cats still have enough functional kidney tissue so that treatment will be very rewarding.

Treatment can be accomplished at multiple levels, depending on the level of illness of your pet. If your cat

is ill, not eating well, or depressed, the recommended treatment is to hospitalize the patient to help improve kidney efficiency, which usually lasts 2-4 days. Intravenous fluids are given to “flush out” the kidneys. This flushing process, called diuresis, helps to stimulate the kidney cells to function again. If enough functional kidney cells remain, they may be able to adequately meet the body’s needs for waste removal. Fluid therapy includes replacement of various electrolytes, especially potassium. Other important aspects of initial treatment include proper nutrition and drugs to control vomiting and diarrhea.

What will happen after the first few days of treatment?

There are three possible outcomes due to the first phase of treatment:

- 1) The kidneys will improve functioning and continue to function adequately for a few weeks to a few years.
- 2) The kidneys will improve functioning during treatment but be unable to maintain their function after the patient is released from the hospital.
- 3) Kidney function will not improve.

Unfortunately, there are no reliable tests that will predict the outcome.

If my cat improves, is treatment concluded?

No. Your cat’s kidneys are still damaged; they will never be normal again. Without continued treatment your cat will soon be back in kidney failure. Therefore, home treatment is vital. Its goal is to keep the kidneys functioning as long as possible. This may be accomplished with one or more of the items listed below, depending on the situation.

What if my cat does not seem to be sick?

The two most important changes to make early in the diagnosis of CRF are:

Water: Make sure your pet has constant access to plenty of fresh water at all time. Animals in CRF are producing more urine than normal, and are losing excessive water. They must be allowed to replace that loss. Introducing a drinking fountain to your cat may improve water intake as most cats enjoy fresh water.

Diet: Feed diets that are low in protein and high in calories. High protein may contribute to further kidney damage. Hill's K/D, Purina CNM-NF, Iams Kidney Failure Formula, and Royal Canin Low Protein are several such protein-restricted foods available. Canned foods may be preferred by your cat, and also have higher water content.

What can I do to help support my pet’s kidneys?

Maintaining your pet’s quality of life and longevity after their kidneys have become insufficient is a balancing act of supportive care. Many medications, diets, supplements, and life style changes are available, though not all are needed for every patient. Following is a list of potential items to consider or monitor for you pet.

- **Hydration:** This is one of the most important things you can do for your pet! Even though your pet may seem to drink more and have adequate access to water, they are often losing more water than they consume. Chronic dehydration worsens kidney function. Once your cat is stabilized, fluids can be given under the skin (subcutaneously). This serves to continually “restart” the kidneys as their function begins to fail again. This is done once daily to once weekly, depending on the degree of kidney failure. Although this might not sound like something you can do, you will be surprised at how easily the technique can be learned and how well most cats will tolerate it. Our staff is well trained at educating owners to give fluids to their pet. Please don’t hesitate to ask

for training.

- **Special diet:** Diets that are formulated for kidney failure are low in protein but higher in calories. Low protein diets seem to permit the kidneys to work less, therefore last longer. These diets are also lower in phosphorus and help pets regulate their body pH better. These factors help to lower the amount of protein waste in the blood, control excessive phosphorus buildup, and reduce pH imbalances; together they usually make your cat feel better. We can recommend a commercially prepared food that is formulated for kidney disease. Recommendations include Hills K/D, Purina NF, and Iams Modified Renal diets.

Weight loss and muscle loss is common despite a normal appetite. **If your pet is not eating well, however, it is more important to ensure adequate calorie intake**, and you may feed them anything they will eat. Appetite stimulants or nausea medications may help improve your pet's appetite and help them to maintain their weight.

- **Omega 3 Fatty acid supplementation:** research has shown that omega 3 fatty acids actually help reduce ongoing inflammation and damage to kidney cells, and may help reduce further decline in renal function. Fish oil is the only effective form of this for cats, and must not be exposed to oxygen. We recommend fish oil capsules punctured and the liquid added to wet food.
- **Potassium supplementation.** Potassium is lost in the urine when urine production becomes excessive. A potassium supplement will replace that loss. Low potassium levels have been shown to further reduce kidney function. This is the second reason that a potassium supplement is recommended.
- **Nausea or vomiting control:** A decreased appetite is often the only indicator of an upset stomach in cats. Owners will often report that they seem hungry or thirsty but won't eat. Increased toxins in the bloodstream can increase stomach acid, which can cause nausea or anorexia. Several types of medications are useful in making your cat more comfortable, and are often used in combination.
- **Phosphate reduction:** One of the secondary things that occurs in kidney failure is an elevation of the blood's level of phosphorus. This also contributes to lethargy and poor appetite. Certain drugs will bind excess phosphates in the intestinal tract so they are not absorbed, resulting in lower blood levels of phosphorus. If the special diet is not successful in maintaining normal phosphate levels in the blood, a phosphate binder is used.
- **Blood pressure control:** Many cats with kidney failure have high blood pressure, which can worsen damage to kidneys and lead to blindness if untreated.
- **Anemia:** The kidneys produce erythropoietin, a hormone that stimulates the bone marrow to make red blood cells. Therefore, many cats in kidney failure have a low red blood cell count, anemia. Epogen™, a synthetic form of erythropoietin, will correct the anemia in most cats. Unfortunately for some cats, the drug cannot be used long term because the immune system recognizes the drug as "foreign" and will make antibodies (immune proteins) against it.
- **Dental Health:** Significant dental disease is common in older cats with kidney disease. This can be of significant concern as oral infections can spread through the blood stream to the kidneys, and cause a sudden decline in their health. In addition, oral infections and painful teeth can contribute to decreased appetite, weight loss, and pain. We recommend that your cat's teeth are kept as clean and healthy as possible to reduce the risk on worsening weight loss and kidney disease.

Anesthesia: If anesthesia is required for surgery or dental cleaning, special precautions are taken to insure good recovery. An intravenous catheter will be placed to ensure good blood flow to the kidneys during anesthesia, and is required for anesthetic procedures.

How long can I expect my cat to have a quality life?

The prognosis is quite variable depending on response to the initial stage of treatment and your ability to perform the follow-up care. However, we encourage treatment in most situations because many cats will respond and have a good quality of life for many more years.

Is kidney transplantation possible?

This procedure is being done at a few selected locations in the United States. Generally, the cat must still be in good condition and not ill from the kidney failure in order to be accepted for a transplant. Also, many transplant centers require that the owner adopt the cat that has donated a kidney for the procedure.

This procedure is not for everyone. The cost is often prohibitive and multiple medications must be given daily for the duration of the cat's life. Repeated blood tests are required to monitor function of the transplanted kidney and to monitor blood levels of the anti-rejection drug. Also, the anti-rejection drug is expensive. But, it is truly a cure for kidney failure.

How often should my pet have blood tests?

Your pet should have blood tests performed every 3 to 4 months to evaluate their kidney function, and weight monitored. If function is steadily declining, additional supportive measures can be added to help.

_____ Your pet should have blood tests repeated _____

What medications does my pet need?

Please give the following medications to your pet as directed.

_____ Give _____ mls fluids subcutaneously _____ times weekly

_____ Please give ____ tablet _____ times daily. This medication is for _____ and should be given for _____

_____ Please give ____ tablet ____ times daily. This medication is for _____ and should be given for _____

_____ Give mirtazapine 1/4 tablet once every 3 days
appetite stimulant

_____ Give potassium supplement _____ once / twice daily

_____ Give ½ fish oil capsule (1000 mg) once daily. Buy over the counter, may mix into food
Anti-oxidant for kidneys

_____ Give amlodipine _____ tablet once / twice daily
For high blood pressure

_____ Give enalapril _____ tablet once every other day / once daily.
to improve blood flow to the kidneys.

_____ Give metoclopramide _____ every 8-12 hours as needed
For nausea or vomiting

_____ Give Pepcid AC _____ tablet once / twice daily
For upset stomach

_____ Give aluminum hydroxide _____ every 8-12 hours as needed
For phosphorus reduction

_____ Give procrit, then reduce as directed
For anemia

Diet:

_____ No changes in your pets diet are needed.

_____ Please feed _____ or _____

Monitoring chart for your pet's kidney values

WEIGHT							
BUN (14-30)							
Creatinine (0.6 – 2.4)							
Phosphorus (4-7)							
Potassium (3.8 – 5.0)							
Calcium (9-11)							
Blood Pressure (100 – 140)							
PCV (35-50)							