Renal Insufficiency / Kidney Failure (Chronic Renal Failure)

What You Should Know

If My Pet Is Still Making Plenty of Urine, How Can There Be Kidney Failure?

In chronic kidney failure, urine is usually produced in excessive quantities. What the kidneys are failing to do is conserve water (they are failing to make concentrated urine). The body produces numerous toxins on a moment by moment basis. These toxins circulate to the kidneys where, dissolved in water, they are filtered out and urinated away. An efficient kidney can make a highly concentrated urine so that a large amount of toxin can be excreted in a relatively small amount of water.

When the kidneys fail over a long time period, they lose their ability to concentrate urine and more water is required to excrete the same amount of toxin. The animal will begin to drink more and more to provide the failing kidneys with enough water. Ultimately, the animal cannot drink enough and toxin levels begin to rise. Weight loss, listlessness, nausea, constipation, and poor appetite become noticeable. It is common for animals, especially cats, to have a long history of excessive water consumption when they finally come to the vet's office with one of the latter complaints.

What Is my Veterinarian Reading on the Blood Panel?

If you wish to understand your pet's status with regard to kidney failure, it is important to understand some of the parameters being monitored.

**Urine Specific Gravity** - This is a measure of how concentrated a urine sample is. Water has a specific gravity of 1.000. A dilute urine sample has a specific gravity less than 1.020 (often less than 1.010). A concentrated urine sample would have a specific gravity over 1.030 or 1.040.

**Blood Urea Nitrogen (BUN)** - This is a protein metabolite excreted by the kidney (it is one of the toxins we are concerned about). In a normal animal, the BUN is 25 or so. A good goal for BUN in kidney failure is 60 to 80. Often at the time of diagnosis, BUN is well over 150, 200, or even 300.

**Creatinine** - This is another protein metabolite (though this one is less dependent on dietary protein intake than is BUN). A normal creatinine is less than 2.0. A good goal in kidney failure is a creatinine of 4.5 or less. BUN and creatinine will be tracked (as will several other parameters) over time and in response to different treatments.

**Phosphorus** - The calcium/phosphorus balance becomes deranged in kidney failure due to hormone changes that ensue as well as the inability of the failing kidney to excrete phosphorus. If calcium and phosphorus levels become too high, the soft tissues of the
animal's body will develop mineralized deposits which are inflammatory and uncomfortable. The bones will weaken as well. If phosphorus can be maintained in the normal range (less than 7.5), a medication called calcitriol can be used to help prevent or slow the progression of kidney failure. Medications and special diets can be used to help keep phosphorus levels down.

**Potassium** - The failing kidney is unable to conserve potassium efficiently and supplementation may be needed. Signs of hypokalemia (the scientific name for low blood potassium) include weakness, especially drooping of the head and neck.

**Packed Cell Volume/Hematocrit** - This is a measure of red blood cell amount. More literally it represents the percentage of the blood made up by red blood cells. The hormone that stimulates the production of red blood cells is made by the kidney. The failing kidney does not make this hormone in normal amounts and anemia can result. Anemia is often worsened by the extra fluid administrations needed to manage the kidney toxins. Sometimes a blood transfusion is needed or, more commonly, the owner of the pet must learn how to give hormone injections to boost the red blood cell count.

**Blood Pressure** - Blood pressure is not something measured off a laboratory result sheet but it is important to monitor in kidney patients as there is a tendency for hypertension to develop in kidney failure. Special medications may be needed to manage this problem should it arise.

*The owner who plans to be involved with monitoring of the pet's condition at home should become familiar with these terms and even get a copy of the pet's lab results for their own records.*

*Your veterinarian is likely to have a handwritten chart in your pet's record showing changes in the above parameters; it's not a bad idea to start your own folder and chart at home.*

**What Are the Treatment Options?**

What one does to address this problem depends on its stage at the time of diagnosis. More advanced cases will require hospitalization for a cycle of diuresis. Fluids are delivered intravenously for 48 to 72 hours and the above parameters are rechecked. The goal is to stabilize the patient at a toxin level where good life quality can be indefinitely experienced.

Milder cases can be managed with fluid administration under the skin (subcutaneous fluids) at home. This sounds scary at first but, in fact, it is not uncomfortable for the pet and is easy to learn.
Also available (but very expensive) are dialysis, where a machine filters the toxins from the patient's blood, and kidney transplantation.

What Sort of Treatments Might my Pet Require at Home?

Special Diet:

Most prescription diet companies produce a diet with restricted protein (so as to generate less BUN), restricted phosphorus, and with other important qualities to promote metabolic health in kidney patients. Many clinics stock K/D diet made by Hills and Select Care Modified made by Innovative Veterinary Diets. In some cases, simply switching to this food may be adequate treatment. There is no preventive benefit that we know of in changing to these diets prior to the onset of kidney failure.

Amphojel/Phosphate Binders: Amphojel is an antacid caplet used for stomach upset in people. It also binds phosphates in the diet when it is given with food. This reduces the phosphorus intake from the GI tract and helps normalize the blood phosphorus level.

Calcitrol: This medication actually represents activated vitamin D. Vitamin D is not a vitamin in the way other vitamins are or in the way we think of vitamins; vitamin D is actually a hormone. It plays an important role in calcium phosphorus balance and is beneficial in preventing the progression of kidney failure when it is administered while phosphorus levels are still normal. Our experience with this medication has been excellent and we recommend its use in appropriate patients whole-heartedly. The doses that are used are exceedingly small and must be compounded by a special pharmacy. If your pet qualifies to take this medication, special instructions on how to obtain it will be given to you.

Tumil K: This potassium supplement is available in a powder, tablet, or gel. If a patient does not seem to be maintaining a normal potassium level, such a supplement may be prescribed.

Epogen/Erythropoeitin: In older times, anabolic steroids were used to address the anemia (low red cell count) of chronic kidney disease. With the advent of genetic engineering, the actual hormone the kidney has stopped producing can be given by injection. This is done usually at home 2 to 3 times a week along with an oral iron supplement. This treatment has helped many patients dramatically as the anemia that goes with kidney disease can be very debilitating. The downside to this treatment is that the product commercially available for use is of human origin and pets will ultimately produce antibodies against it (and worse still against their own remaining hormone). For this reason, this hormone is not used until anemia is more advanced and the patient really needs this treatment.
**Amlodipine (brand name Norvasc):** It is difficult to find a blood pressure medication that is not also toxic to the kidneys. Amlodipine is a calcium channel blocker type medication commonly used in hypertensive cats with renal failure. It also must be compounded specially in cat sized doses.

**Fluids Under the Skin:** This technique is important to learn as most pets in kidney failure require this treatment either right away or following hospitalization. If this process is recommended for your cat, you will receive lessons on how this technique is performed.

*Kidney failure is a complicated disease with many facets. Please do not hesitate to contact your veterinarian should you have questions or problems at home. You will periodically be contacted when it is time for your pet to have monitoring tests.*

**You Are Not Alone: Further Resources**

Chronic renal failure is a common disease and there are many pet owners just like you all sharing thoughts, tips, and information over the internet. If you are interested in exploring these resources, here is what is available:

A large information area has been structured at [http://www.felinecrf.com/](http://www.felinecrf.com/) by the owner of Avatar, a cat who ultimately succumbed to his kidney failure. While this site is especially geared for cat owners, its information is certainly applicable to dog owners as well.

For those with America On-Line subscriptions, there is a weekly feline chronic renal failure chat to which all are welcome. This chat is held on Sundays from 5 to 6 pm Pacific Time in the private room called "crf." (Click on "People Connection," click on "Private Room," type in "crf.")

There is also an on-line mailing list (a listserv) for owners of cats with chronic renal failure. To subscribe go to [http://groups.yahoo.com/group/Feline-CRF-Support/](http://groups.yahoo.com/group/Feline-CRF-Support/).

Please do not hesitate to ask your veterinarian if you have any questions or problems regarding your pet's condition.