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## CHRONIC KIDNEY FAILURE IN DOGS

### *What does "Chronic Kidney Failure" mean?*

The term "chronic kidney failure" suggests that the kidneys have quit working and are not making urine. However, by definition, kidney failure is the inability of the kidneys to remove waste products from the blood. This term can be confusing because kidney failure doesn't mean the inability to produce urine. Ironically, most dogs in kidney failure produce large quantities of urine, but the body's wastes are not being effectively eliminated.

### *When is this likely to happen in my dog?*

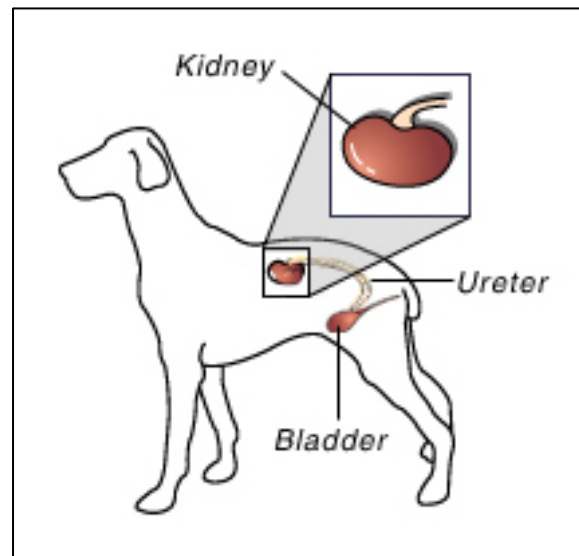
The typical form of chronic kidney failure is associated with aging. It may be thought of as a "wearing out" process. The age of onset is often related to the size of the dog. For most small dogs, the early signs occur at about 10-14 years of age. However, large dogs have a shorter age span and may go into kidney failure as early as seven years of age.

### *What changes are likely to occur in my dog?*

The kidneys are blood filters. When 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 dog from becoming dehydrated due to increased fluid loss in the urine, thirst and water consumption is increased. Thus, the early clinical signs of kidney failure are increased water consumption and urination. The clinical signs of more advanced kidney failure include loss of appetite, depression, vomiting, diarrhea, and very bad breath. Occasionally, ulcers will be found in the mouth. When kidney failure is accompanied by these clinical signs, it is called *uremia*.

### *How is chronic kidney failure diagnosed?*

The diagnosis of kidney failure 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. A low urine specific gravity (USpG) is the earliest indication of kidney failure.



Although BUN and creatinine levels reflect kidney failure, they do not predict it. A dog with marginal kidney function may have normal blood tests. If that dog is stressed with major illness or surgery, the kidneys may fail, sending the blood test values up quickly.

***Since this is basically just a wearing out process, can it be treated with anything other than a kidney transplant?***

In some cases, the kidneys are damaged beyond repair and treatment is ineffective. However, with early diagnosis and aggressive treatment, many dogs will live for several months or years.

Treatment occurs in two phases. The first phase is to “restart” the kidneys. Large quantities of 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 can I expect from this phase of treatment?***

There are three possible outcomes from the first phase of treatment:

- 1) The kidneys will resume functioning and continue to function for a few weeks to a few years.
- 2) The kidneys will resume functioning during treatment but fail again as soon as treatment stops.
- 3) Kidney function will not return.

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

***If the first phase of treatment is successful, what happens next?***

The second phase of treatment is to keep the kidneys functioning as long as possible. This is accomplished with one or more of the following, depending on your pet’s condition:

1. **A special diet.** The ideal diet is low in protein, low in phosphorus, and not acidified. This type of diet reduces the amount of protein wastes or “metabolic toxins” that may make your pet feel sick and lethargic. In advanced kidney disease, a decreased protein diet will decrease the workload on the kidneys. We can recommend a commercially prepared food that has the quantity and quality of nutrients needed by your dog.
2. **A phosphate binder.** Phosphorous is removed from the body by filtering through the kidneys. Once the filtration process is impaired, phosphorous begins to accumulate in the blood. 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.
3. **Home fluid therapy.** Once your dog is stabilized, fluids can be given under the skin (subcutaneously). This serves to continually flush toxins from the kidneys as their function continues to fail. 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 easy the technique is and how well most dogs tolerate it.



4. **A drug to regulate the parathyroid gland and calcium levels.** Calcium and phosphorus must remain at about a 2:1 ratio in the blood. The increase in blood phosphorus level, as mentioned above, stimulates the parathyroid gland to increase the blood calcium level by removing it from bones. This can be helpful for the sake of the normalizing calcium: phosphorus ratio, but it can make the bones brittle and easily broken. Calcitriol can be used to reduce the function of the parathyroid gland and to increase calcium absorption from the intestinal tract. This is recommended if there is evidence of abnormal function of the parathyroid gland.
5. **A drug to stimulate the bone marrow to produce new red blood cells.** The kidneys produce erythropoietin, a hormone that stimulates the bone marrow to make red blood cells. Therefore, many dogs in kidney failure have a low red blood cell count, anemia. Epogen™ or Procrit™, synthetic forms of erythropoietin, will correct the anemia in most dogs. Unfortunately for some dogs, the drug cannot be used long term because the immune system recognizes the drug as "foreign" and will make antibodies against it. This is recommended if your pet has persistent anemia.

***How long can I expect my dog to live?***

The prognosis is quite variable depending on response to the initial stage of treatment and your ability to perform the follow-up care. We encourage treatment in most situations because many dogs will respond and maintain a good quality of life for up to four years.