Most people discover their pet has been diagnosed with Kidney Failure or Chronic Kidney Disease at a routine visit. Or your pet may have been sick, and you brought them in for an examination.

When your veterinarian takes a blood sample, the most common tests they run are BUN, Creat, Phos, and K+.. Below you will find a table of normal values for my lab; be aware that different labs or equipment may have slightly different ranges.

**SO WHAT DO THOSE ABBREVIATIONS MEAN?**

**Blood urea nitrogen (BUN),** helps assess kidney function as well as hydration. In starvation, or poor liver function, levels of BUN may be low, since protein is not being taken in in adequate amounts, being processed properly by the liver, or is being depleted. With kidney failure, this value fluctuates more than creatinine, as the animal’s hydration fluctuates.

**Creat, short for creatinine,** is a waste product of muscle creatine, and is generally a direct measure of how well the kidneys are doing their job. When the kidneys are functioning properly, they are able to clear Creatinine well, and keep the blood level under control. BUN and creat generally do not start to rise until at least 75% of the kidney has been insulted or damaged.

**Phosphorous, or phos,** is a mineral necessary for normal bodily function. As the kidneys become less able to do their jobs, they are not able to filter out phosphorus. As phosphorus levels climb, many of the symptoms associated with severe kidney disease appear: nausea, vomiting, diarrhea, lack of appetite. There may be other compounds we can’t measure that increase along with phosphorous, and they likely are responsible for
creating much of the lethargy or depression that goes with advanced disease.

Potassium, represented by its chemical name K+, may stay normal, go too low, or too high with renal disease, and generally is not out of normal range until much later in the disease. The blood level may not be the same as what is in the cell, so for some animals, supplementing with potassium often makes them feel better early in the disease.

PCV or HCT stand for packed cell volume and hematocrit. These are measures of the numbers of red cells your pet has in their blood. The kidneys produce less erythropoietin than they should as kidney failure progresses. Erythropoietin stimulates the bone marrow to produce red blood cells. If there is not enough, pets can become anemic. Anemia leads to feeling weak and lethargic, as well as depriving the tissues of oxygen.

<table>
<thead>
<tr>
<th>Blood Value</th>
<th>Normal for Dogs</th>
<th>Normal for Cats</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUN</td>
<td>7 - 25</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Creat</td>
<td>0.3 - 1.4</td>
<td>0.3 - 2.1</td>
</tr>
<tr>
<td>Phos</td>
<td>2.9 - 6.6</td>
<td>3.4 - 8.5</td>
</tr>
<tr>
<td>K+</td>
<td>3.7 - 5.8</td>
<td>3.7 - 5.8</td>
</tr>
<tr>
<td>HCT or PCV</td>
<td>35 to 50 %</td>
<td>35 to 55%</td>
</tr>
</tbody>
</table>
WHY DO YOU NEED TO FOLLOW THESE NUMBERS?

The International Renal Interest Group (IRIS) has developed a classification system designed to guide veterinarians in their diagnosis and treatment of each pet. The first part of the classification looks at creatinine values, and then places the pet in a stage based on the value.

Stage 1 is generally without symptoms, and may actually have values in the normal range for some machines and laboratories. These stages progress up to stage 4, which is considered the final stage of the disease. As the pet progresses through the stages of kidney disease, symptoms increase, and the need for support increases.

IRIS STAGING GUIDELINES
IS CREATININE THE ONLY TEST USED TO STAGE KIDNEY DISEASE?

IRIS staging also involves two other tests to help differentiate severity of disease. UPC, or urine protein to creatinine ratio, helps determine how well the kidneys are doing at conserving protein in relationship to the creatinine being excreted.

As part of a urinalysis, your pet may have some protein noted in its urine. Because the test sticks can give false positives, it is important to know if the kidneys are losing too much protein, or if levels are consistent. The UPC provides a definitive result. A UPC of less than 0.2 for dogs and cats is considered normal.

Blood pressure regulation is another facet of the very important work the kidneys do. Increased blood pressure puts pets at risk for nasty things like heart disease, retinal detachment, and more importantly, decreased blood flow to the kidneys, and worsening kidney function. Normal Blood pressure for dogs and cats are systolic <150, diastolic < 95.
A urine sample tells us several things: how well the kidneys are able to concentrate the urine, if there is infection present, if there are crystals in the urine, and the urine pH. We can also tell if there is some evidence of protein in the urine, which can be further defined with UPC (as we discussed above).

Even if the urine looks normal, but is dilute, it is often recommended to do a test called a Urine culture and sensitivity, as occult, or hidden, urinary tract infections can be a cause of or worsen kidney function.

Many pets have occult urinary tract infections that go undetected for years. A urine culture and sensitivity takes a small amount of urine plated on a medium designed to grow bacteria, and then identify by species, which bacteria are growing there. If Bacteria do “grow out,” then tiny pellets of antibiotics are placed on the media to determine which antibiotics the bacteria are sensitive to, and will kill the bacteria. If there is an underlying
occult infection, clearing it will help prevent kidney function from worsening, and may help improve function.

**WHY IS ABDOMINAL ULTRASOUND NECESSARY?**

Abdominal ultrasound is a simple, relatively in-expensive way to look at internal organ structure in a more three-dimensional way. An ultrasound is not as high a quality image as an MRI, but does not require anesthesia, and is much less expensive. Ultrasound is used to tell us if there are any cysts in the kidneys, kidney stones, infection, or cancer. It is often “normal” for most pets; but because ultrasounds can provide more specific results, help veterinarians determine if something is out of the ordinary, and can determine more specific expectations, it can be useful in advising on treatment options.

If your veterinarian does not have an ultrasound machine, abdominal X-rays may also be recommended to make sure there is no evidence of large kidney stones or soft tissue masses in the abdomen. Kidney size and shape can be roughly assessed as well.

**NOW THAT I UNDERSTAND THE BASICS, WHAT DO I DO?**

I hope this introduction has been helpful in understanding the basics of CKD.

The survival times associated with the various IRIS stages can be scary for pet owners. For dogs in stage 3, 267 days is the median survival time. For cats, it is a bit better: 778 days (a little over 2 years), with a range of 22 to 2,100 days.

I want to help your pet do better than that! With proper nutrition, and a targeted supplement program, I know that your pet can thrive, and stave back the onslaught of symptoms associated with this awful, and unfortunately, common pet illness.

Use the worksheet entitled “9 Essential Labs To Ask For” to help you keep track of where the numbers are going for your pet. Also start using the
“Kidney Health Quick Start Guide” to help support your pet’s kidney function. Talk with your veterinarian, who will be an important part of your pet’s health care team.

If you’ve enjoyed my Kidney Health Starter Kit, you are going to love Dr. Ruth Roberts’ Kidney Health for Dogs & Cats. This program gives you a deep dive into keeping your pet with Chronic renal failure healthy longer. You will learn about normal and abnormal kidney function, conventional as well as alternative therapies, and at what stage to apply the various treatment options for Kidney failure. This program will help you sort through what’s right for you and your pet, and give you the information you need to make the best decisions you can for your companion.

If you have more specific questions, let me know. And while I know it’s not easy to let go of the worry surrounding your pet’s diagnosis, take a breath in the relief that there are treatment options available!