

Tests and Procedures

Urinalysis and Early Kidney Disease Detection

- In kidney disease, the kidneys do not function properly.
- Acute (sudden) kidney disease may be reversible, but chronic (long-term) kidney disease is usually progressive, meaning that it worsens over time.
- Kidney disease can be detected early with the help of a urinalysis.
- A urinalysis is an examination of a dog's or cat's urine to assess the health of the urinary tract, including the kidneys, and organs such as the liver and the pancreas.
- Ideally, the urine sample should be obtained by a relatively painless procedure called a *cystocentesis*, in which a needle is placed directly into the urinary bladder.
- To evaluate kidney function, the urinalysis should be interpreted with the results of a blood test called a *chemistry panel*.
- Your veterinarian may recommend a urinalysis if your pet is showing signs such as increased drinking, increased urination, and urinary accidents.
- A urinalysis may also be part of a routine screening examination, especially in older pets.

What Is Kidney Disease?

Kidney disease is a broad term meaning that the kidneys are not functioning properly. Acute kidney disease occurs quickly, often over the course of a few days, and is caused by a lack of oxygen to the kidneys or exposure to toxins such as anti-freeze, pesticides, and some medications. If treated promptly, acute kidney disease may be reversible. Chronic kidney disease occurs over the course of months to years and is usually progressive, meaning that it worsens over time. Early detection and treatment of chronic renal disease can slow the progression of the disease and help keep your pet more comfortable.

What Are the Signs of Kidney Disease?

Pets with kidney disease may display any or all of the following signs:

- Increased drinking
- Increased urination
- Anorexia and weight loss
- Vomiting
- Lethargy
- Constipation or diarrhea

How Can Kidney Disease Be Detected Early?

When the kidneys begin to fail, they lose their ability to concentrate urine. Urine that was once deep yellow in color becomes dilute (more clear in appearance). While the difference in concentration isn't always obvious to the naked eye, it can be

A urinalysis is an examination of a dog's or cat's urine to assess the health of the urinary tract, including the kidneys, and organs such as the liver and the pancreas.

detected by a urinalysis. However, you may notice that your pet is drinking more water, urinating more frequently, and urinating in inappropriate places.

What Is a Urinalysis?

As the name implies, a urinalysis is the analysis of a pet's urine. While a urinalysis is generally performed to evaluate the health of the urinary tract, including the kidneys, it can also provide information about the state of organs such as the liver and the pancreas.

How Is a Urinalysis Performed?

Ideally, a urine sample should be obtained by cystocentesis—a relatively painless procedure in which a needle is placed through the abdominal wall directly into the urinary bladder. A urine sample obtained in this manner is not contaminated by bacteria in the lower urinary tract.

Urine samples can also be retrieved by placing a catheter (rubber tube) up the urinary tract into the bladder, but this procedure often requires anesthesia and may be difficult to perform on female pets. Samples obtained by “free catch” into a cup while the pet urinates or taken off the floor or exam table are usually contaminated with bacteria but may be sufficient for evaluating kidney function.

During a urinalysis, the technician will first evaluate the urine color and clarity or cloudiness. The urine is then assessed for specific gravity, which measures the ability of the kidneys to concentrate urine.

Insufficient ability to concentrate urine is noted by an abnormal specific gravity and is often one of the first signs of early kidney disease.

The urine is then applied to a treated dipstick that changes color to identify the pH (acidity or alkalinity) of the urine and the presence of several substances, such as protein, glucose, red blood cells, and white blood cells. For example, the presence of glucose in the urine often indicates diabetes. Protein in the urine may be a sign of kidney damage.

Finally, the urine is centrifuged to separate the solids from the liquid, and the sediment is examined under a microscope for crystals, red blood cells or white blood cells, bacteria, and other abnormal substances.

What Other Tests May Be Done to Detect Kidney Disease?

A urinalysis should be evaluated with the results of a chemistry panel blood test. In early kidney disease, a low specific gravity may be the only abnormality identified. When the kidneys lose the ability to concentrate urine, the pet begins to urinate larger amounts. To make up for this loss of fluid, the pet drinks more than usual.

As kidney disease progresses, the concentrations of blood urea nitrogen (BUN) and creatinine rise in the blood. These two waste products are normally removed from the blood by the kidneys. When the kidneys aren't functioning efficiently, the waste products increase in the blood and can be identified by the chemistry panel. A diagnosis of kidney failure can be made by confirming a loss of urine-concentrating ability combined with increased BUN and creatinine blood levels.

Your veterinarian may recommend a radiograph (x-ray) to examine the size and shape of the kidneys. The kidneys may also be visualized by ultrasound.

What Are the Benefits of Kidney Function Testing?

Kidney function testing can identify acute kidney disease so that proper treatment may potentially reverse the condition. While early detection of chronic kidney failure can't stop the progression of the disease, treatment can help slow the process and help make your pet more comfortable. For example, a low-protein diet has been shown to help slow kidney disease progression.