



## **Commonly asked questions about kidney disease in companion animals**

### **What do the kidneys do?**

The kidneys not only filter the blood and remove waste products, they help regulate blood pH, and maintain the body's water balance. The kidneys also help regulate blood pressure and produce a hormone called erythropoietin that is important in red blood cell production.

### **Who gets kidney disease?**

Although some breeds of cats and dogs are predisposed to kidney problems, any animal can develop kidney disease. Kidney damage can be sudden (**acute**) or can develop over time (**chronic**).

Sometimes the two conditions can co-exist, such as if a patient with chronic kidney disease suddenly gets a urinary tract infection.

Acute kidney injury is usually seen in young and middle-aged animals, since they tend to be more likely to ingest toxic substances. Chronic kidney disease is more common in middle-aged to older animals. Although statistics are lacking for dogs, chronic kidney disease may affect between 35% and 50% of cats older than 15 years old.

### **What happens when the kidneys are damaged?**

The kidneys have a limited ability to repair themselves. One reason is that the kidneys are made up of thousands of individual functional units known as "nephrons." If one part of a nephron is damaged, the entire nephron becomes non-functional. If too many nephrons are damaged, kidney function deteriorates, sometimes permanently.

### **What causes acute kidney injury?**

Toxins such as anti-freeze, grapes, raisins, and lilies are well known examples of toxins that are very damaging to the kidneys. However, the kidneys can be affected by non-fatal exposure to toxins, medications (even when given at appropriate doses), prolonged dehydration and low blood pressure. Examples of drugs that can be toxic to the kidneys include platinum-based chemotherapeutic agents and non-steroidal anti-inflammatories like aspirin, carprofen and meloxicam. Other causes of acute kidney injury include infections, like bacterial infections, and trauma.

### **What causes chronic kidney disease?**

Chronic kidney disease is defined as abnormal kidney function that is present for longer than three months. Aging is one of the most common, if not the most common, cause of chronic kidney disease. Other causes include a history of previous trauma or damage to the kidney, infectious agents like leptospirosis, and drug or toxin exposure. There are some unusual causes of chronic kidney disease including immune-mediated diseases and, in rare cases, even cancer.

Some breeds of dogs and cats have inherited kidney abnormalities that can result in altered kidney function. Abnormal kidney function is sometimes noted in these patients at a very early age, but in others it can take years for clinical signs to arise.

## What are the signs of kidney disease?

- Increased thirst (chronic)
- Increased urination (chronic)
- Decreased urination (acute)
- Decreased appetite
- Depression, lethargy
- Vomiting, nausea
- Halitosis (bad breath)
- Mouth and stomach ulcers
- Pale gums (chronic)
- Discolored urine, straining to urinate, hunched posture (rare)

## How is kidney disease diagnosed?

Kidney disease is diagnosed through a combination of physical examination findings, history and laboratory analysis. Physical examination findings are often non-specific, but the history provided by the pet owner can be extremely helpful. Blood tests and urinalysis remain the cornerstone of diagnosis. Ultrasound examination of the kidneys is a newer diagnostic test that helps determine the underlying cause of kidney dysfunction. Other tests performed might include blood pressure measurement, urine culture (if infection is suspected) and urine protein measurement.

## How is kidney disease treated?

The treatment of kidney disease depends on the type of injury and its duration. Is this a 17-year-old cat with a history consistent with chronic disease? Or is this a young dog that ate grapes?

The treatment of **acute kidney injury** helps stimulate urine production, which tends to be markedly decreased or absent in most cases. Additional therapies might include:

- Fluid support
- GI protectants/antacids
- Treatment of the underlying toxicity, if possible
- Dialysis

The treatment of **chronic kidney disease** focuses on slowing down the progression of kidney dysfunction, as well as improving quality of life. Treatment of chronic kidney disease (in both dogs and cats) might include:

- Diet changes
- Fluid therapy (tends to work best in cats)
- Omega-3 fatty acid supplementation
- Correction of any underlying diseases
- Treatment of hypertension, if present
- Phosphorus-binding agents
- Correction of anemia

## **Why is dietary management of chronic kidney disease important?**

Diet therapy can slow progression of chronic kidney disease in patients with more advanced disease and should be instituted in consultation with your veterinary professional. There is reliable, scientific evidence to support dietary management of chronic kidney disease. There is no data that supports diet change as a preventative measure.

## **What is the prognosis for dogs and cats diagnosed with kidney disease?**

Unfortunately, the prognosis remains poor for dogs and cats with acute or severe kidney injury, with mortality rates reported around 50%. However, for those patients that survive, prognosis is reported as very good. There are a few reports that suggest that some patients may have residual kidney damage, but do not show any signs of kidney disease.

For chronic kidney disease, prognosis tends to be variable but often very good for cats with treatment. For dogs, the prognosis remains poorer, even when treated.

## **What is Morris Animal Foundation doing to help?**

Morris Animal Foundation has a long history of research into kidney disease in dogs and cats. Foundation founder Dr. Mark Morris Sr. created the first prescription kidney diet more than 70 years ago. He created the diet to treat Buddy, one of the first guide dogs in the United States. Since that time, Morris Animal Foundation has invested \$4 million in 108 studies focused on the urinary system. Studies have encompassed a wide range of topics, from causes of urinary tract stone formation to the infectious causes of kidney disease. In addition, the Foundation has remained a leader in research on the dietary management of chronic kidney disease. New and active studies include investigation of the use of stem cells in the treatment of chronic kidney disease in cats, methods to treat excessive protein loss in the urine, and the effect of anti-kidney antibodies on the progression of kidney disease in cats.