

# Chronic Kidney Disease in Dogs

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## BASIC INFORMATION

### Description

Chronic kidney disease (CKD), also called chronic renal failure, is long-standing (greater than 3 months) kidney dysfunction that is manifested by dilute urine (urine that is not as concentrated as it should be) and retention of urea (uremia) and other waste products in the body. CKD is a common problem in older dogs but can also occur in young and middle-aged dogs.

### Causes

In many cases, the underlying cause of CKD is never discovered. Identifiable causes include kidney infections and stones, incomplete recovery from previous damage (such as acute kidney failure), and diseases of the glomerulus (filtering structure) in the kidney (such as protein-losing nephropathy or glomerulonephritis). In young dogs, congenital kidney disease (such as kidney dysplasia) may be the cause. CKD may also arise as the kidneys deteriorate with age in older dogs.

### Clinical Signs

CKD may be detected on routine screening of blood and urine prior to the onset of signs. Diagnosis at this stage allows treatments to be started that may slow the progression of CKD. Early clinical signs may include increased water intake and urine production, decreased appetite, and nausea. In later stages, vomiting, lethargy, and dehydration may be apparent. Physical examination findings may include dehydration, weight loss or muscle loss, small or irregular kidneys, and a uremic odor to the breath.

### Diagnostic Tests

Initially, a biochemistry panel, complete blood test, and urinalysis are usually recommended. With CKD, kidney function tests, such as blood urea nitrogen (BUN) and creatinine, are elevated. Levels of certain blood chemicals (especially phosphorus) may also be abnormal. Urinalysis is crucial to determine the ability of the kidneys to concentrate the urine and to look for protein in the urine.

Additional diagnostic tests may include a urine culture to screen for infection, blood pressure measurement (especially if there is protein in the urine) to check for high blood pressure (hypertension), and a complete blood count to look for anemia. Abdominal x-rays and an ultrasound are often done to look for kidney stones, evidence of infection, or other changes. In some cases, a kidney

biopsy may be recommended, along with laboratory tests to rule out other diseases that can cause similar signs.

## TREATMENT AND FOLLOW-UP

### Treatment Options

Currently, no treatments are available that will reverse CKD. The goals of treatment are to slow progression of CKD and treat the clinical signs. Feeding a special kidney diet, which contains less protein and phosphorus, is the most effective method of slowing progression of CKD. Dogs eating a kidney diet can live twice as long as those eating a regular maintenance diet. These diets can be started even before signs occur.

Control of the blood phosphorus levels is also necessary. If diet alone does not accomplish this, drugs to bind the phosphorus in the food can be given with each meal. Administering a form of vitamin D (calcitriol) may also help delay an increase in phosphorus. If chronic dehydration is present, injections of fluid under the skin (subcutaneous fluids) may be helpful. The frequency varies from daily to twice weekly, and the injections can be given at home.

Excess protein in the urine can be treated with angiotensin-converting enzyme (ACE) inhibitor drugs. If hypertension is present, a variety of drugs can be used to control it. Dogs rarely develop low blood potassium levels from CKD, but potassium supplements may be needed in some cases. Severe, advanced anemia can be treated with hormone injections to stimulate production of red blood cells, but some dogs develop side effects from the hormone the longer it is used. If vomiting is present, antacids (such as famotidine or omeprazole) or antiemetics (such as metoclopramide, ondansetron, or dolasetron) may be prescribed.

### Follow-up Care

Follow-up visits often involve examinations, laboratory tests, and blood pressure measurements (when available). Frequency of visits depends on the severity of CKD, with monthly visits recommended in advanced cases. Dogs with early, stable disease may only need to be rechecked every 3-6 months.

### Prognosis

CKD is a progressive disease that slowly worsens, but the rate of progression is highly variable. Some dogs may worsen over months, and others over 2-3 years, before reaching a point where quality of life deteriorates to an unacceptable level.