



## **PYELONEPHRITIS**

### **What is Pyelonephritis?**

Pyelonephritis is a bacterial infection of the upper urinary tract including the kidneys and ureters.

### **What Causes It?**

Infection of any portion of the urinary tract usually requires some impairment of normal host defenses against urinary tract infection. Pyelonephritis usually occurs by ascension of bacteria from a bladder infection. Rarely, bloodborne bacteria can cause pyelonephritis too. Regardless of the route of infection, upper urinary tract infection is frequently accompanied by lower urinary tract infection.

### **What are the Symptoms of Pyelonephritis?**

It probably occurs much more commonly than is recognized clinically, because many animals with pyelonephritis show no signs or have signs limited to lower urinary tract infection.

Signs may include: None, increased water consumption and urine production, and abdominal or lumbar pain. Signs associated with lower urinary tract infection can include straining, bloody or bad smelling urine, frequent urination, or discolored urine. Some pets will show a fever.

### **How is Pyelonephritis Diagnosed?**

The clinical diagnosis of pyelonephritis is usually presumptive based on results of blood cell counts, biochemical analysis, urinalysis, urine culture, and diagnostic imaging. Definitive diagnosis is not usually required for planning treatment. Ultrasonography or excretory urography are often helpful and kidney stones may be detected in some animals by survey x-rays, ultrasonography, or excretory urography (contrast dye x-rays).

### **How is Pyelonephritis Treated?**

**DIET:** Dietary modification is recommended in animals with concomitant chronic renal failure or kidney stones. Prescription diets are used for various aspects of this disease.

**CLIENT EDUCATION:** Unresolved chronic pyelonephritis may lead to chronic renal failure.

Diagnostic follow-up is important to document resolution of the disease. In animals with kidney stones, resolution is unlikely unless the kidney stones are removed.

**SURGICAL CONSIDERATIONS:** Infected kidney stones can be surgically removed, medically dissolved (struvite stones), or fragmented by extracorporeal shock wave lithotripsy (where available).

**MEDICAL TREATMENT:** Patients requiring hospitalization are given intravenous fluid therapy, and a wide variety of medications depending on the many variables of this disease condition. Antibiotics are a necessary part of the treatment. Antibiotic selection may require urine bacterial culture and sensitivity testing.

**EXPECTED COURSE AND PROGNOSIS:** The prognosis for patients with pyelonephritis is fair to good with a return to normal health unless the animal also has kidney stones, chronic kidney failure, or some other underlying cause of urinary tract infection (e.g., obstruction or tumor).

Established infection of the kidney medulla may be difficult to resolve because of poor tissue penetration with antibiotics. The prognosis for patients with chronic kidney failure caused by pyelonephritis is determined by the severity and rate of progression of the chronic kidney failure. Recurrent pyelonephritis is likely if infected kidney stones are not removed.

### **Call Us If...**

- Your pet is reluctant to eat or seems depressed.
- Your pet vomits repeatedly or has diarrhea.
- Your pet faints or acts dazed or confused.
- There is a change in your pet's water intake and/or urination.

*Thank you for this opportunity to serve you!*