



**LAKESHORE**  
 VETERINARY SPECIALISTS  
 &  
 EMERGENCY HOSPITAL

PORT WASHINGTON 262.268.7800 • RACINE 262.554.5344

[www.LakeshoreAnimalHospital.com](http://www.LakeshoreAnimalHospital.com)

## URINARY CALCULI

**What is it?** Urinary calculi are stones or mineral concretions that form in the urinary tract. They can be found and cause problems in the kidneys, ureters, bladder or urethra. Bladder and urethral stones are most common.

**What animals are affected?** Any animal can be affected. There are several types of stones and certain breeds are predisposed to each:

- *Struvite*—Miniature Schnauzer, Min. Poodle, Bichon Frise, Cocker Spaniels
- *Calcium Oxalate*—Min.& Std. Schnauzers, Min. Poodle, Bichon Frise, , Lhasa Apso, Yorkshire Terrier, Shih Tzu. Cats: Burmese, Persian, Himalayan
- *Urate*—Dalmation
- *Cystine*—Dachshund
- *Silicate*—German Shepherd, Old English Sheepdog, Golden Ret., Labrador Ret.

**What are the clinical signs?** Animals with kidney or bladder stones may be asymptomatic or may have chronic recurrent urinary tract infections or hematuria (blood in the urine). Animals with stones in the ureter may develop hydronephrosis and hydronephrosis (enlargement of the ureter or kidney from back up of urine, which may lead to permanent damage to the kidney). These animals can be asymptomatic initially but may become painful and sick as a result of kidney malfunction. Animals with stones in the urethra often exhibit pollakiuria (frequent urination, small amounts), dysuria (difficult urination), stranguria (straining to urinate), or may become completely obstructed and unable to urinate. This condition causes significant discomfort and distress as well as potentially life threatening electrolyte disturbances.

**How is it diagnosed?** Diagnosis is made based on clinical signs, urinalysis, and radiographs of the abdomen. Most stones are radioopaque (will show up on a radiograph); however, some are not and may require contrast studies or ultrasound to be detected.

**How is it treated?** Kidney stones are often left alone unless they are causing chronic infections or obstruction of the kidney. Ureteral and bladder stones are typically treated with surgical removal (ureterotomy or cystotomy); however, some types of stones can be dissolved with special diets so they are small enough to pass. Urethral stones are ideally flushed back into the bladder (retrohydropropulsion) and then retrieved from the bladder (cystotomy). If a urethral stone cannot be flushed back, then a “temporary” urethrotomy can be done to remove the stone. If the urethral stone cannot be retrieved in this manner or the urethra itself is compromised/damaged from the stones’ presence, a permanent urethrostomy can often be done, effectively by-passing the obstruction.

**What is the aftercare?** The patient will remain hospitalized at least one night after surgery to ensure that he or she is comfortable and able to pass urine. These patients are typically diuresed (given IV fluids to help normalize hydration, blood chemistries and electrolytes) for 12 to 72 hours, depending on their condition. Home care involves restricted activity for two weeks and continued monitoring of urination. If there is a concurrent urinary tract infection, these patients will be on antibiotics as well. Recheck urinalysis and blood work are often recommended if there was an infection or kidney function was impaired. Some pets will require special dietary management to minimize recurrence of crystals in the urine and stone formation.

**What is the prognosis?** Prognosis for patients with urinary calculi is typically very good as long as they are treated early before significant damage is done to the kidneys, and they recover well from their procedure. There is a risk for recurrence, particularly if the stones are caused by a metabolic abnormality that can be “managed” but not “cured” and if treatment recommendations are not followed.

**Can it be prevented?** Some types of urinary calculi can be prevented with specific dietary management and supplementation. Maintaining the health of an animal, feeding a well balanced diet, and keeping fresh water readily available will help. Recognition of clinical signs, early detection, and treatment can help avoid a life threatening situation that can be seen with complete urinary obstruction and impairment of kidney function.

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