



勝利動物醫院  
Victory Animal Hospital

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## Bladder Stones in Dogs

### What are bladder stones?

Bladder stones (*uroliths* or *cystic calculi*) are rock-like formations of minerals that develop in the urinary bladder. There may be a large, single stone or a collection of stones that range in size from sand-like grains to gravel. It is common for a mixture of both small and large stones to be present.

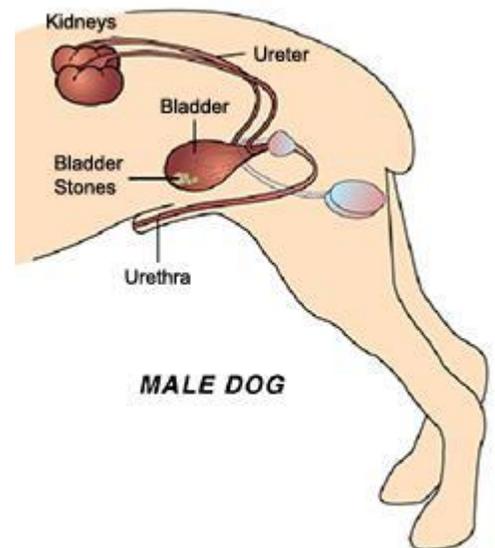
### What other kinds of stones are there?

Gall stones form in the gall bladder and contain bile salts. Kidney stones are mineralized formations that develop in the kidney. Neither of these are directly related to bladder stones. Even though the kidneys and urinary bladder are both part of the urinary system, the development of kidney stones is not usually linked to the development of bladder stones. All stones form as a result of disease or inflammation in the affected structure.

### What are the clinical signs of bladder stones?

The most common signs that a dog has bladder stones are *hematuria* (blood in the urine) and *dysuria* (straining to urinate). Veterinarians assume that the condition is painful, because people with bladder stones experience pain, and because many clients remark about how much better and more active their dog becomes following surgical removal of bladder stones.

Large stones may act almost like a valve or stopcock, causing an intermittent or partial obstruction at the neck of the bladder, the point where the bladder attaches to the urethra. Small stones may flow with the urine into the urethra where they can become lodged and cause an obstruction. If an obstruction occurs, the bladder cannot be emptied fully; if the obstruction is complete, the dog will not be able to urinate at all. If the obstruction is not relieved, the bladder may rupture. A complete obstruction is potentially life threatening and requires immediate emergency treatment. A urinary obstruction will usually be recognized in a dog that is straining to urinate without producing any urine, or is only producing small squirts of urine.



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## How did my dog get bladder stones?

This may be due to dietary factors or due to some previous disease in the bladder, especially a bacterial infection. Sometimes the condition may be due to a problem with the body's metabolism. When the amount of this compound exceeds a threshold level, the urine becomes *saturated* and cannot hold any more of the compound. The saturation level depends on the specific minerals that are present and the pH of the urine. The excess precipitates out of solution and forms tiny crystals. The sharp crystals irritate the bladder lining, causing a production of mucus. The crystals and mucus stick together, forming clusters that gradually enlarge and harden into stones. This is similar to the way "rock candy" is formed.

## How are bladder stones diagnosed?

Most bladder stones are visible on radiographs (x-rays) or an ultrasonic bladder examination. Some bladder stones are *radiolucent*, or are not visible on radiographs because their mineral composition does not reflect x-ray beams. They can be detected by an ultrasound examination. Therefore, one or more of these diagnostic imaging techniques should be performed on dogs that show signs of abdominal pain or have recurrent episodes of cystitis.

## How are bladder stones treated?

In general, there are three main treatment options for bladder stones: 1) surgical removal; 2) non-surgical removal by urohydropropulsion, and 3) dietary dissolution. The specific treatment that is recommended for your dog will depend on the type of stone that is present. Your veterinarian will discuss the pros and cons of each treatment option with you in more detail, based on your dog's individual circumstances.

## Can bladder stones be prevented?

Prevention is possible in some cases, depending on the chemical composition of the stones. There are at least four types of bladder stones common in dogs

**"bladder stones should be analyzed for their chemical composition"**

Whenever possible, bladder stones (either those that are removed surgically or those small ones that have been passed in the urine), should be analyzed for their chemical composition. This will permit your veterinarian to determine if a special diet will be helpful in preventing recurrence.

*This client information sheet is based on material written by: Ernest Ward, DVM*

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