

Nutritional Concerns for Dogs with Bladder Stones

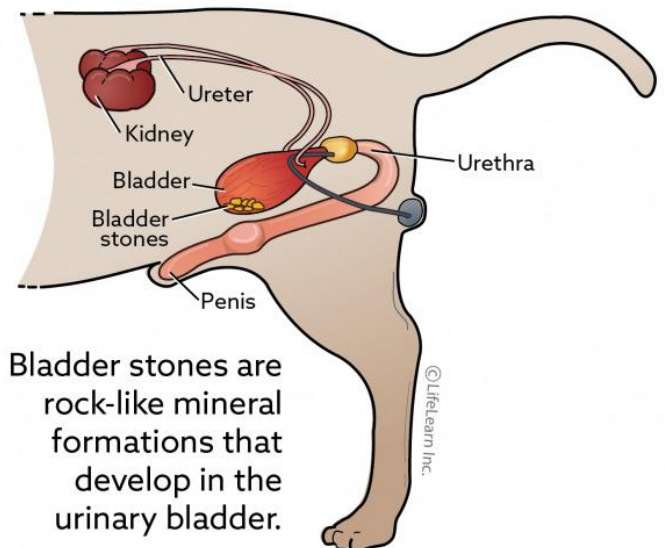
My dog has bladder stones and he is scheduled for surgery to remove them. I have been told they will be analyzed to determine their composition. Once we know their makeup, will there be a way to prevent them from coming back?

Bladder stones are common in dogs. They are the result of one or more underlying abnormalities, making stone analysis a critical step in the diagnostic process. It is also important to evaluate what the dog was fed before the bladder stone diagnosis and analyze blood and urine for clues as to how nutrition may aid in preventing bladder stone recurrence.

Bladder stones set the stage for chronic urinary tract infection, and some bladder stones (struvites) grow more quickly if the dog already has a urinary tract infection. Consequently, urinary tract infection and bladder stones commonly occur together. Therefore, your veterinarian will recommend long-term antibiotics to kill bacteria on an ongoing basis while the bladder heals from surgery and the bladder lining returns to normal. Resolving or controlling bladder infection is one important way to prevent recurrence of bladder stones.

Is there any chance that bladder stones can be dissolved rather than resorting to surgery?

The opportunity to dissolve bladder stones in dogs, called **dissolution**, depends on the composition of the stones. Unfortunately, the most effective way to know the composition of a canine bladder stone is to remove one and have it analyzed. That said, it may be possible to draw some conclusions about the composition of a bladder stone based on crystals identified during the urinalysis. Also, it may be possible to retrieve a small bladder stone for analysis via a urethral catheter.



Bladder stones are rock-like mineral formations that develop in the urinary bladder.

Your veterinarian will work closely with you to determine if attempting medical dissolution is a reasonable option for your dog. In most cases, surgical removal of bladder stones is the treatment of choice. Surgery provides the following benefits:

- prevents blockage of urine outflow, which is a true emergency.
- relieves the dog of the discomfort of stones in the bladder.
- allows bladder healing to begin.
- allows for definitive analysis of the stone(s), which provides the best opportunity to prevent recurrence.

How will I know what steps I need to take and what I need to feed my dog in order to prevent his bladder stones from recurring?

The nutritional focus for a particular dog will depend on the specific diagnosis that dog receives, and your veterinarian is a key partner in creating an overall plan that best fits your dog's bladder stone composition. There are, however, some general statements that can be made about the nutritional management of bladder stones that occur in dogs:

- **Purine stones.** Dissolution **may** be possible with appropriate protein-restricted therapeutic nutrition combined with measures to increase urine production (diuresis), creating an alkaline urine pH, controlling/eliminating any existing urinary tract infection, and giving a medication called allopurinol (brand name Zyloprim®). This is the same plan to prevent recurrence.
- **Calcium oxalate stones.** Dissolution has not proven to be effective, so the nutritional focus is designed to prevent recurrence. Goals include reducing dietary calcium in order to reduce the calcium excreted in the urine, reducing oxalic acid in the urine, inhibiting calcium oxalate crystal growth, and reducing urine specific gravity (concentration). Diets that may help include Royal Canin® Urinary SO, Purina® ProPlan® Veterinary Diet UR Ox™/St™, Hill's Prescription Diet® w/d® Multi-Benefit, or Rayne Clinical Nutrition Adult Health-RSS™. Table food may be a problem for these dogs.
- **Calcium phosphate stones.** Dissolution has not proven to be effective. Prevention is complicated because these stones are uncommon and may result from several different underlying causes at once. Nutritional prevention of recurrence involves feeding wet versus dry food, limiting sodium intake, and managing urine pH (depending on the dog's metabolic profile). There are no specific diet recommendations. The dog may also need additional medication.
- **Cystine stones.** Dissolution may be possible using a protein-restricted therapeutic food with a controlled sodium level, and one that supports an

alkaline urine pH (examples include Hill's Prescription Diet® u/d® or Royal Canin® UC Low Purine). Any existing urinary tract infection must be resolved. This is also the nutrient profile that would be used following surgery. Potassium citrate (brand names NutriVed, Urocit-K®) can be used to alkalinize the urine. Tiopronin (brand name Thiola®) may be used to bind to the excess cystine and remove it from the body.

- **Struvite stones.** Dissolution may be possible by resolving an existing urinary tract infection and utilizing an appropriate nutrient profile. The appropriate nutrient profile for dissolution is relatively high in fat, potentially providing worry about pancreatitis, which means close monitoring is necessary. The food will also cause increased thirst and more dilute urine. Diets include Hills Prescription Diet® s/d® or c/d®, Royal Canin Urinary SO™, Purina® Pro Plan® Veterinary UR Urinary™, and Rayne Clinical Nutrition Adult Health-RSS™. The complete prevention plan will depend on the individual dog, but will generally focus on creating a slightly acidic urine while monitoring to prevent formation of calcium oxalate crystals and/or stones, which can form in urine that is very acidic.
- **Silica stones.** These bladder stones are very rare. Dissolution has not yet been documented. Post-surgery, there is limited data to provide a clear path to prevention. General guidelines include feeding a nutrient profile with reduced vegetable protein and other plant-based ingredients, higher animal protein, feeding moist food versus dry, and feeding a food that supports an alkaline urine pH. A urine alkalinizing agent (such as the potassium citrate) may also be needed.

Regardless of the ultimate treatment of canine bladder stones - surgical removal or dissolution - nutrition will play a critical role in preventing recurrence. Once a nutritional profile has been chosen, it is important to feed **only** what has been prescribed, so speak to your veterinarian before offering any additional food or treats. The add-ons may undermine what the prescribed nutrient profile is able to do to prevent bladder stones from recurring.