

Your Pet's Biologically Imperfect Food Can Lead to Struvite Stones

Linked to more than 1/3 of cases of this urinary problem in dogs, and half the cases in cats. Find out which age and gender it affects the most, what to look for, when you need to seek emergency help, and how to prevent it in the first place.

Analysis by [Dr. Karen Shaw Becker](#)

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STORY AT-A-GLANCE

- Struvite stones are bladder stones that develop in both dogs and cats. The condition accounts for over a third of all urinary tract stones in dogs and about half of all urinary stones in cats. The problem is seen most often in female pets at middle age
- Struvite stones can be caused by alkaline urine, steroid therapy, abnormal retention of urine, a urinary tract infection, or another disorder of the urinary tract. Common symptoms include frequent urination, straining to urinate, urinating in inappropriate places, cloudy or bloody urine, and increased thirst
- Diagnosis of a stone will include manual palpation of the abdomen, urinalysis, a urine culture and sensitivity test, x-rays and ultrasounds
- If urine flow is completely blocked, this is a medical emergency and you should have your pet seen by a veterinarian right away. Otherwise, the situation can often be managed with medication and dietary adjustments
- To reduce urine pH — which is the goal in most struvite situations — you must feed your pet a low-carb, grain-free, potato-free, species-appropriate diet. When dogs and cats who are designed to eat meat are fed a grain-based diet or a starch-rich diet, the starch alkalizes urine pH, which can lead to the development of struvite crystals and stones. Sometimes, surgery is required to remove stones in the urethra, ureters or bladder

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Today, I'd like to discuss struvite stones and crystals. Struvite stones are a type of bladder stone that occurs in both dogs and cats. They're also called triple phosphate and magnesium ammonium phosphate stones.

Magnesium, ammonia, and phosphate are common elements in urine. In high enough concentrations, they bind together to form crystals that can irritate and inflame the bladder. When the crystals combine with mucus, they can form a plug that blocks the urinary tract. The crystals can also fuse together to form struvite stones.

Struvite stones account for over one-third of all urinary tract stones in dogs and about half of all urinary stones in cats. The problem is seen more often in female dogs and cats, and pets that are from six to seven years of age.

Causes and Symptoms

The causes of struvite stones include extremely alkaline urine (often from a biologically inappropriate diet), high steroid use, abnormal retention of urine, a urinary tract infection, or another disorder of the urinary tract.

Dog breeds prone to struvite stones include the miniature schnauzer, shih tzus, bichons, miniature poodles, cocker spaniels, and the lhasa apso.

Some pets with bladder stones show no signs, but common symptoms include frequent urination, straining to urinate, an abnormal urinary stream (for example, the dog lifts his leg and maybe a few drops come out, and then a few drops more), urinating in inappropriate places (especially if it's an indoor kitty), cloudy or bloody urine, and oftentimes, increased thirst.

Diagnosing a Struvite Stone

If there's a lot of inflammation present, the bladder may be enlarged. And sometimes the stones can actually be palpated (felt) through the abdominal walls.

Urine samples will be taken to check for abnormalities. A urinalysis will provide information about the presence of blood, protein, glucose, ketones, and bilirubin. It will also determine the concentration of urine, which is a measure of kidney health and can be a contributing factor to stone formation. A urinalysis will also pick up the presence of white blood cells indicating inflammation or infection.

A urine culture and sensitivity test will reveal if there is bacteria present and can also determine what medication will be most effective in clearing the infection. Because certain bacteria can exacerbate struvite formation, this is a very important step your vet should not overlook. However, some pets experience bladder inflammation with crystals or stones, but no infection is present. In this case, a different management protocol is required.

X-rays and ultrasounds are typically used to determine the size, shape, and location of the stones and to assess different treatment options.

Treating Crystals and Stones

Please note: A urinary blockage is a medical emergency requiring immediate treatment. This particular problem is seen much more often and is much more serious in male pets than females. If your pet can't urinate, you need to get him or her to a veterinary clinic immediately.

If your pet has crystals or stones that aren't completely blocking or occluding the urethra, making it possible for urine to pass, the situation can often be managed with medication and dietary adjustments.

The first thing to do for a pet with crystals or stones is to create a healthy urine pH that is neither too acidic nor too alkaline. A pH of 7 is neutral. Everything above 7 is alkaline, and everything below 7 is acidic.

Dogs and cats, as carnivores, should have a slightly acidic urine pH, optimally between 6 and 6.5. We want to maintain the urine pH at no more than 7, because a higher pH will predispose the animal to developing struvite crystals.

Some pets are genetically predisposed to producing a protein called cauxin, which is excreted into the urine, causing sterile crystals or sterile struvite crystalluria. This means the crystals can form without the presence of infection. These animals are very prone to chronic cystitis, as these sharp crystals cause microtrauma to the lining of the bladder that results in discomfort and irritation.

Many holistic veterinarians use traditional Chinese medicinals, homeopathy, and nutraceuticals to help with this condition, including things like glucosamine and cranberry extract, which can help reduce inflammation in the bladder.

If you're a dog owner, I recommend buying pH strips from your vet or at the local drug store to check your pet's urine pH at home so you know when it's in or outside the desired range. In the morning prior to feeding your dog is when you should collect the urine sample. You can either hold the pH tape in the stream of urine while your dog is voiding, or you can catch a urine sample in a container and dip the tape into the sample to check the pH. This should be done immediately with a fresh sample to insure accuracy.

I recommend you keep a log of your pet's urine pH to show to your veterinarian at your appointments.

To reduce urine pH — which is the goal in most struvite situations — you must feed your pet a low-carb, grain-free, potato-free, and preferably fresh or at least canned food diet for the increased moisture content. When dogs and cats who are designed to eat meat are fed a grain-based diet or a starch-rich diet, the starch alkalizes urine pH, which can lead to the development of struvite crystals and stones.

Often, a pet's urine pH can be maintained naturally between 6 and 6.5, a good healthy range, on a species-appropriate diet. Dry pet food causes an increase in urine concentration, which can contribute to crystal and stone formation. Creating more dilute urine by offering a moisture-rich diet is critical to avoiding a recurrence of stones or crystals. A species-appropriate diet in combination with infection management is often effective at dissolving struvite stones, but it can take a few weeks to several months for the stones to completely disappear.

Stones located in the urethra or the ureters (the tubes that connect the kidney to the bladder), typically must be removed surgically along with any stones that don't dissolve despite dietary changes and medical management.

Surgery to remove a bladder stone is known as cystotomy. Depending on the patient and the location and size of the stone, there are some other less invasive procedures that might be appropriate. These include a technique called laser lithotripsy that breaks down stones into smaller pieces that can then be voided out, and a procedure called voiding urohydropropulsion, which is a technique that involves manually expressing stones out through the urethra while the patient is sedated.

If your pet has been diagnosed with struvite crystals or stones, it's imperative that you continue treatment until the condition is resolved, and then incorporate a proactive prevention plan to avoid recurrence.

A urinalysis should be completed monthly until all the crystals are dissolved and then every six months to ensure your pet isn't brewing additional crystals or stones.
