

Bladder Stones and Kidney Stones

- Urinary stones are made of minerals and can form anywhere in the urinary tract of dogs and cats.
- These stones can irritate the bladder lining and obstruct urine flow from the kidney to the bladder or from the bladder out of the body.
- Signs may include more frequent urination, blood in the urine, urinary accidents, or recurring urinary tract infections.
- Pets with a blockage may be unable to urinate, may strain or vocalize (whimper or yelp) while urinating, or may vomit and seem tired, and should be seen by a veterinarian immediately.
- Stones may be caused by urinary tract infections or metabolic disorders; some breeds of animals are more likely to have stones.
- Stones are usually diagnosed with an abdominal radiograph (x-ray) or with an abdominal ultrasound.
- Some stones may be dissolved with special diets, but others may require removal with surgery or other methods.
- Pets with a history of stones may benefit from special diets to help prevent recurrence.

What Are Bladder and Kidney Stones?

Bladder and kidney stones are hardened accumulations of minerals found in urine. Common minerals involved include struvite, calcium oxalate, and urate. Dogs and cats can develop stones anywhere in the urinary tract. Stones can form in many different shapes and sizes.

Certain breeds of animals may be more likely to form certain kinds of stones. Dalmatians, for example, are more likely to develop urate stones.

Stones can have sharp edges. They can irritate or become embedded in the lining of the bladder, causing the tissue to become thickened and inflamed. They can also form inside the kidneys.

Stones can cause serious problems when they lodge in the ureters (the thin tubes connecting each kidney to the bladder) or the urethra (the narrow tube that allows urine to flow from the bladder out

of the body). When the normal flow of urine from the kidney to the bladder is obstructed, urine (and pressure) can build up in the kidney, potentially causing kidney infections or kidney failure.

If a stone obstructs the urethra, the pet is unable to urinate, and the urine builds up inside the urinary tract. This occurs more commonly in male pets because, compared with females, they have a longer and very narrow urethra. When pets are unable to urinate, it's a medical emergency, and a veterinarian should see the pet immediately.

Stones may be caused by urinary tract infections or metabolic disorders; some breeds of animals are more likely to have stones.

What Causes These Stones?

Stones are often caused by an underlying condition that alters the balance of minerals or other substances that are excreted in the urine. Factors that could influence the risk for the formation of stones include:

- Type of food the pet is eating
- Urinary tract infections
- Metabolic diseases
- Genetic predisposition (breed of animal)

What Are the Signs of Bladder and Kidney Stones?

Most stones are found in the bladder. Pets with bladder stones may show no signs at all or may exhibit signs such as the following:

- More frequent urination
- Blood in the urine
- Urinary accidents
- Recurring urinary tract infections

Common Conditions

Signs of a possible urinary blockage include:

- Straining to urinate
- Inability to urinate
- Crying in the litterbox (cats)
- Vomiting
- Anorexia
- Painful abdomen
- Lethargy (tiredness)

Pets with kidney stones may show no signs or may have persistent blood in the urine. If a blockage affects the kidneys, the pet may have pain near the middle of the spine (where the kidneys are located) or may drink and urinate more.

How Are Urinary Stones Diagnosed?

Some veterinarians may be able to feel stones in the bladder by applying gentle pressure with their hands. In most cases, an abdominal radiograph (x-ray) is required. Since some stones do not appear on regular radiographs, contrast medium (a sterile solution that appears bright on radiographs) may need to be injected into the urinary tract to help make the stones more visible. An abdominal ultrasound may also be helpful to visualize stones.

If the urethra is obstructed with a stone, the veterinarian will usually be able to feel a firm bladder, and the pet may have signs of pain.

Testing the urine is helpful to determine if a urinary tract infection is present. Sometimes crystals may be found in the urine, which may provide a clue as to the type of stone involved. Still, the only way to identify the type of stone with certainty is to send sample stones to a laboratory for analysis. This is important because treatment will vary depending on the stone.

How Are Bladder and Kidney Stones Treated?

In pets with blockages, emergency surgery is usually required. If the pet is not blocked, some stones can be dissolved by feeding the pet a special diet. This food, available only through veterinarians, will help modify the urine pH and dissolve the stones.

Some types of stones cannot be dissolved by diet and must be removed from the bladder using other methods, including:

- **Voiding urohydropropulsion:** While the pet is sedated, small stones may be flushed out by filling the bladder with fluid and applying pressure to empty it (only works for small stones)
- **Basket retrieval:** A small scope (a long, thin device with a tiny camera) is inserted into the urethra while the animal is under anesthesia, and stones are found and removed (not possible in male cats)
- **Laser lithotripsy:** A small scope is inserted into the urethra, and a laser is used to break up the stones into smaller pieces which then may pass through the urethra (not possible in male cats)
- **Surgery:** The bladder is opened through the abdomen, and the stones are removed

While kidney stones may be removed by surgery, this procedure may affect kidney function. Another alternative, which is usually only available at universities, is called *extracorporeal shock wave lithotripsy*. In this procedure, shock waves are used to break up stones in the kidneys and ureter so that they become small enough to pass in the urine.

Once stones are removed, they are generally submitted to a diagnostic laboratory so their type/ composition can be determined. Once the stone composition has been determined by lab analysis, pets may need to be fed a special diet and/or given medication for the rest of their lives to help prevent recurrence.