



**Veterinary Emergency
+ Referral Center**
of Hawaii

**Ettinger: Textbook of
Veterinary Internal Medicine, 7th Edition
Lower Urinary Tract Disease in Cats
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What is lower urinary tract disease?

An overarching premise is that feline idiopathic cystitis (FIC) is not just a bladder disorder but involves complex interactions of the two main arms of the body's stress response system:

1. The sympathetic nervous system
2. The endocrine system

The sympathetic nervous system acts through release of stress hormones such as norepinephrine and epinephrine, whereas the adrenal glands (organs in the endocrine system) release cortisol and a plethora of other steroids. FIC appears to be characterized by an exaggerated sympathetic nervous system and a blunted endocrine response to stressors that do not seem to affect healthy cats. Any treatment strategy to decrease sympathetic nervous system outflow may be important in reducing clinical signs. Reducing the noxiousness of the urine to the damaged bladder wall and normalizing bladder permeability may also prove useful.

What are the symptoms of lower urinary tract disease?

Symptoms of lower urinary tract disease in cats include variable combinations of the following:

- Frequent attempts to urinate
- Straining to urinate
- Urinating in inappropriate places in the house
- Crying out during attempts to urinate
- Blood tinged urine

These signs are not specific for any one disease; they can be seen in cats that have the following:

- Bladder stones (cystic calculi)
- Bacterial urinary tract infections
- Cancer
- Other mass lesions in the bladder

In fact, when clinicians are unable to find a specific cause for these symptoms, this syndrome is called *idiopathic cystitis* (FIC).

How is lower urinary tract disease diagnosed?

Before diagnosing FIC, your veterinarian may suggest some diagnostic tests to rule out the more defined causes for these symptoms. Because bladder stones are present in about 15% of cats with lower urinary tract (LUT) disease, an x-ray to check this possibility is a good place to start. The x-ray will also allow your veterinarian to see the entire LUT including the urethra, which is especially important in male cats. The two most common stones are calcium oxalate and struvite, which can be detected on radiographs. More specialized studies may be required to identify other, much less common stone types such as urate and cystine.

Although diet may play a role in stone formation in some cats, other factors that may contribute to the formation of cystic calculi include the cats':

- Breed
- Age
- Sex
- Disease status
- Body condition
- Living environment

The many interacting variables demonstrate the complexity of the process of stone formation. If your veterinarian decides that your cat may have a stone, it is a good idea to obtain an x-ray to get a quick "stone check."

In addition to an x-ray, a urine culture test for a bacterial urinary tract infection may be submitted, especially in cats with recurrent episodes of LUT signs. If a bacterial infection is diagnosed, appropriate antibiotics are prescribed and ideally, the urine should be re-cultured 3 to 4 days after cessation of the antibiotics to be sure the urine is sterile. If recurrent urinary infections are diagnosed, further diagnostics are warranted to evaluate the cat for underlying disorders, which might be predisposing him/her to these infections.

If radiographs (and other imaging studies) are negative, it is likely the cause for the cat's clinical signs will not be determined, especially if the cat is young (younger than 8 years). If signs are persistent, severe, recur often, or if the cat is older than 10 years, an examination of the bladder surface using a small "telescope" (cystoscopy) may be warranted. This procedure, which is done under general anesthesia, allows one to visualize the urethra, ureteral openings, and bladder with a small scope. Tiny stones, polyps, tumors, and other abnormalities can be seen, which may have been difficult to evaluate with other imaging studies. If no underlying cause can be found for the LUT signs, the diagnosis of FIC is confirmed.

What treatment is needed?

The underlying causes of FIC are incompletely understood, so current treatment recommendations must necessarily be tentative. The current goals of therapy for cats with FIC are to decrease the severity of their symptoms and to increase their symptom-free period, especially for the severely affected cats. Furthermore, this disorder does not appear to be restricted solely to the bladder, so the "entire cat" should be evaluated and other identified problems addressed.

Based on the abnormalities that have been documented in this disease, we have developed some treatment guidelines that may be helpful.

From what we have observed in cats with this disorder, it appears to be a painful condition. During an acute episode, pain relief therapy may be prescribed. A mild sedative may also be beneficial to decrease the anxiety that can be seen during acute flare-ups. This therapy is generally prescribed for 2 to 3 days. One should pay close attention to make sure that at least small amounts of urine are passed, especially in male cats.

If a stone is found, surgery may be the only option for stone removal. If "sand and debris" or even very small stones (3 to 5 mm) are found in the urinary bladder, surgery may not be necessary. A technique called *urohydropropulsion* (infusing saline into the bladder and flushing the stones out throughout through the urethra under heavy sedation or anesthesia) may be used to remove the sand or small stones. All stones should be submitted for quantitative analysis. Once the stone is removed, your cat should be monitored every 2 to 3 months for recurrence until the danger of another stone is past.

Canned food may be preferable for cats with FIC because the increased water content in canned food may dilute potential noxious components in the urine, which may decrease the pain associated with this disorder. Offering choices of canned and dry food in separate, adjacent containers rather than replacing the usual food with a new food permits cats to express their favorites. If cats will not eat canned food, other preferences for water should be investigated. Consideration may be given to freshness, taste, movement (water fountains, dripping faucets, or aquarium pump-bubbled air into a bowl), and shape of container (some cats seem to dislike having their whiskers touch the sides of the container when drinking). Food and water bowls should be cleaned regularly unless individual preference suggests otherwise.

The environment should be addressed with the premise that providing an "enriched" environment for these cats will help to decrease the sympathetic "overdrive" and prolong the inter-episode interval. Litter boxes should be cleaned regularly and placed in a quiet, easily accessible area of the house. More than one litter is suggested. Litter should be unscented. Litter box size and type (open or covered) also may be important to some cats.

Cats interact with both the physical structure and other animals, including humans, in their environment. The physical environment should include opportunities for climbing, scratching, hiding, and resting. Because cats are not pack animals, cats residing in multi-cat households should have their own area to "escape" from one another. Some cats may even prefer to have their own separate food and water sources, litter box, and resting areas to avoid competition. This permits them to avoid unwanted interactions. Playing a radio to habituate cats to sudden changes in sound and human voices and to provide visual stimulation may also be helpful. More information about environmental therapy for cats is available at www.nssvet.org/ici

Once environmental strategies have been employed, it still may be necessary to utilize other therapeutic approaches such as pheromone or drug therapy. *Pheromones* are natural substances produced by cats. They seem to transmit highly specific information between animals of the same

species. Feliway (Ceva Sante Animale, Libourne, France) is a synthetic analogue of a fraction of a naturally occurring feline facial pheromone. It was developed in an effort to decrease anxiety-related behaviors of cats. Although not specifically testing in cats with FIC, the anti-anxiety properties of this pheromone may be beneficial, especially in multi-cat households.

Many drugs have been used to treat cats with FIC, although none have been consistently successful for long-term resolution of symptoms.

Some of these medications include the following:

- Analgesics
- Tricyclic and other antidepressants
- Non-benzodiazepine anxiolytic drugs
- Glycosaminoglycan replacers (to improve the lining of the bladder wall)
- Antibiotics, in the case of bacterial infection

Some of these drugs can be of benefit for severe, recurrent FIC. No drugs should be used without a structured environmental strategy as well. Furthermore, these drugs (except pain killers) should never be used to treat acute episodes. Cats should be monitored closely during therapy.

If your cat was diagnosed as having a stone or stones, the best way to reduce the risk of another stone is to feed a prescribed canned diet to make your cat's urine "clear, colorless, and odorless." This will decrease the urine concentration of the mineral precursors that stones form from. Offering the new diet in a separate dish next to the cat's usual food will increase the chances of your cat making the switch to the new food within a few days. When the cat starts eating the new food, the amount of the previous diet may be slowly decreased until the cat is only eating the new food. If your cat will not accept the new diet, water intake can be increased by the use of drinking fountains, or by adding flavorings (ham, tuna) to the cat's water, either as liquids or made into ice cubes. Other treatment regimens for specific stone types can be provided by your veterinarian.

What is the prognosis?

Most cats with FIC are young to middle aged. Symptoms resolve spontaneously in as many as 85% of cats within 2 to 3 days, with or without treatment. Within 12 months, as many as 50% of these cats will have another episode. It is not yet possible to predict which cats with FIC will relapse; some cats have multiple recurrences, whereas clinical signs never resolve in a small population of severely affected cats.