

# **MANAGEMENT OF FELINE LOWER URINARY TRACT DISEASE**

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## **Introduction**

Feline lower urinary tract disease (FLUTD) is a term used to describe any disorder affecting the urinary bladder or urethra of cats and is a common reason for hospital visits and veterinary evaluation of our feline patients. Regardless of underlying cause, FLUTD is characterized by dysuria, pollakiuria, stranguria, hematuria, and/or periuria (urination in inappropriate places). It is important that veterinary technicians are aware of signs and symptoms of FLUTD when talking with clients.

Over the past 10 years knowledge of specific causes of FLUTD has increased in the veterinary profession, allowing diagnostic and therapeutic efforts to be directed toward identification and elimination of specific underlying disorders. The most common cause of FLUTD in cats < 10 years of age is feline idiopathic cystitis (FIC), followed by uroliths, and urethral plugs. A diagnosis of FIC is made by excluding all other causes of FLUTD. In older cats (> 10 years), urinary tract infection and/or uroliths are the most common cause of FLUTD.

In 1981, 78% of feline uroliths were composed of struvite and only 2% were calcium oxalate. In the mid- to late-1980s, the occurrence of calcium oxalate uroliths began to increase. Between 1994 and 2002, approximately 55% of uroliths were calcium oxalate and only 33% were struvite. Since 2001, however, the number of struvite uroliths has continued to increase while occurrence of calcium oxalate uroliths has decreased. Based on 13,991 feline uroliths analyzed at the Minnesota Urolith Center in 2012, the most common mineral types were struvite (45%) and calcium oxalate (42%), followed by purine (5%) and other (6%). In 2012, 92% of urethral plugs evaluated at the Minnesota Urolith Center were composed of struvite, 4% were matrix and 1% was calcium oxalate.

Veterinary technicians play a crucial role in aiding the veterinarian with diagnosis and treatment of FLUTD. The information discerned from owner evaluations aids in the diagnosis of FLUTD; the discussion of the treatment plan with the client is crucial to the client's understanding and compliance with the veterinarian's recommendation, and ultimately the health of the pet.

## **Diagnostic Evaluation**

Diagnostic evaluation of cats with recurrent or persistent lower urinary tract signs should include a urinalysis and diagnostic imaging.<sup>1</sup> If there is a history of urinary tract manipulation (e.g., urethral catheterization), evidence of urinary tract infection (e.g., pyuria, bacteriuria, malodorous urine), or the cat is older (usually > 10 years), a urine culture should be done. More advanced procedures (e.g., contrast radiography) are appropriate in some cases.

Urinalysis is an important part of evaluating patients with signs of lower urinary tract disease. Ideally, the veterinary technician should perform the urinalysis in-house since fresh urine samples analyzed within 30 minutes of collection are preferred. Urine specimens evaluated after this time may form crystals that are not in fact present in the patient. Samples may be refrigerated for up to 8 hours and then evaluated (after the sample has returned to room temperature). This method is not best for evaluating crystalluria and should be avoided as much as possible by the veterinary technician.

Although it may be tempting to only perform dipstick analysis, measure urine specific gravity, and omit urine sediment examination, it is very important to perform a complete urinalysis. The only way to accurately detect pyuria, hematuria, bacteriuria, and crystalluria is by sediment examination. You cannot rely solely on urine dipstick analysis because results for detection of pyuria are often false positive in cats and the occult blood reagent pad on the dipstick is not specific for hematuria (in addition to red blood cells, it also becomes positive with hemoglobin and myoglobin). Pyuria (> 5 WBCs/hpf) indicates inflammation and it may be caused by several disorders (urolithiasis, bacterial infection); it is less commonly observed in cats with FIC. If you see increased numbers of white cells, you should look carefully for bacteria. Take care not to misinterpret presence of cellular debris and Brownian motion as bacteriuria. It is the veterinary technician that really has an impact on this portion of the FLUTD evaluation.

Several different types of crystals may be identified on urine sediment examination, but typically struvite (triple phosphate) and calcium oxalate are the most common. The presence of crystals indicates that the urine is supersaturated with that substance and the patient is at risk for forming uroliths. Remember that cats also may have crystals and never develop uroliths. In the absence of other findings such as uroliths or urethral plugs, the presence of crystals alone is not diagnostic of urolithiasis or struvite disease. Struvite crystals may be present in normal cats as well as cats with struvite uroliths (sterile or infection-induced), non-struvite uroliths (including some cats with calcium oxalate uroliths), urethral plugs, or other urinary disorders such as FIC.

Survey radiographs are helpful for identifying radiopaque uroliths and crystalline-matrix urethral plugs. Remember during positioning to include the caudal abdomen (urethra) in the radiograph, or you risk missing potentially important information. Normal survey radiographs do not exclude FIC, radiolucent uroliths (urate/purine), small uroliths (< 2 mm), neoplasia, blood clots, or anatomic defects. Abdominal ultrasonography and/or contrast urethrocytography is helpful in these cases. If no cause is identified after thorough diagnostic evaluation, a diagnosis of FIC is very likely.

### **Treatments of Cats with Feline Idiopathic Cystitis**

The goals of managing cats with FIC are to decrease severity of clinical signs and increase the interval between episodes of lower urinary tract disease. Over the past 40 years, many different treatments have been recommended to control signs in cats with FIC, yet only a few have been evaluated in clinical trials of cats with FIC.<sup>2</sup>

### **Nutritional Management**

It has been found that feeding moist food (>60% moisture) has been associated with a decreased recurrence of clinical signs in cats with FIC. During a 1-year study, clinical signs recurred less often in cats with FIC when fed a moist food compared with cats fed the dry formulation of the same food.<sup>3</sup> Beneficial effects have been observed in cats with FIC when urine specific gravity values decrease from 1.050 to values between 1.032 and 1.041. Veterinary technicians should be aware of and discuss with clients additional methods for increasing water intake (eg, adding broth to foods and providing water fountains) as these may be useful for some cats.

Increasing salt content of food can cause urine dilution in cats, but the potential for adverse effects should be considered. At this time, there are differing opinions regarding the role of sodium in cats with kidney disease. In a recent study, the effects of high-salt [1.2% sodium, dry matter basis (DMB)] intake for 3 months were evaluated in 6 cats with mild azotemia due to naturally occurring chronic kidney disease.<sup>4</sup> These cats had progressive increases in BUN, serum creatinine, and serum phosphorus compared with consumption of

food with 0.4% sodium (DMB). Based on all findings to date, further study is needed to better determine the role of sodium in healthy cats fed long-term as well as cats with hypertension, chronic kidney disease, and calcium oxalate uroliths. Pending further studies, it is sensible to avoid high-salt foods in cats with chronic kidney disease and monitor kidney function when high-salt foods are fed to cats at risk for kidney disease.

### **Environmental Enrichment**

In addition to nutritional management, the currently recommended treatment for cats with FIC also includes environmental enrichment and stress reduction. This is a crucial component in an FIC treatment plan and one that the veterinary technician should be readily able to discuss with the client.

A recent prospective study evaluating effects of multimodal environmental modification was reported in 46 client-owned cats with FIC.<sup>5</sup> The findings showed significant reductions in lower urinary tract signs, fearfulness, and nervousness after treatment for 10 months. With cats that are suffering with FIC, stressful situations (e.g., conflict with other cats in the home) should be avoided or minimized. Owners should provide opportunities for play/resting (horizontal and vertical surfaces for scratching, hiding places, and climbing platforms). Any changes (eg, switching to a new food) should be made gradually, so the cat has adequate time to adapt and avoid becoming stressed.

Another critical component of managing cats with FLUTD, especially FIC, involves appropriate use and maintenance of litter boxes in the home. The majority of cats prefer clumping, unscented litter; however, it may be necessary to give cats several choices and let them select their preference. It may be possible to have cats within the home that prefer different types of litter or litter boxes. In general, uncovered litter boxes are recommended because they are less likely to trap odors inside. For older cats with mobility issues, the owner should select a litter box with low sides to facilitate the cat getting in and out of the box. Litter boxes should be scooped daily and washed every few weeks with warm soapy water. Because plastic can absorb odors over time (months to years), owners should consider replacing litter boxes with new ones periodically. Finally, there should be an adequate number of litter boxes (the 1 + 1 rule = 1 more than the number of cats) in the home and they should be located on multiple floors where cats can enter and exit readily.

More detailed information about environmental enrichment and litter box management is available.<sup>6-9</sup> It may be helpful to encourage owners to read this additional information as well, because their involvement is critical for a successful outcome. Finally, health care team members, especially technicians, play a crucial role in educating cat owners about the importance of environmental enrichment and litter box management.

### **Managing Cats with Struvite Uroliths or Urethral Plugs**

Treatment options for cats with struvite uroliths include physical removal of uroliths or dissolution via nutritional management. For cats with suspected struvite uroliths, it is appropriate to transition to feeding a canned or dry calculolytic food over a 7-day period. Cats should be re-evaluated every 2-4 weeks (urinalysis and abdominal radiographs). Urine pH should remain < 6.1 and specific gravity should be < 1.040, if canned food is being fed exclusively. Nutritional management (dissolution) should be continued 1 month beyond radiographic resolution of the urolith.

After dissolution or removal of struvite uroliths or urethral plugs, nutritional management should continue to prevent recurrence. There are several commercially available foods for struvite prevention. A dissolution (calculolytic) food is appropriate for initial management (1-3

months) after relieving urethral obstruction; this should be followed by feeding a struvite preventive food indefinitely, with the cat being evaluated routinely by the veterinary healthcare team.

### **Managing Cats with Oxalate Uroliths**

The treatment of choice for calcium oxalate urolithiasis is urolith removal, followed by methods to prevent recurrence. At present, the standard of care for preventing calcium oxalate urolith recurrence is to feed moist therapeutic food and encourage water intake. There are several commercially available canned and dry therapeutic foods for prevention of calcium oxalate uroliths in cats.

All cats should be monitored for recurrence including urinalysis every 3 months to detect calcium oxalate crystalluria and diagnostic imaging every 6 months to detect uroliths. If uroliths recur, less-invasive procedures such as voiding urohydropropulsion are more likely to be effective when uroliths are smaller.

### **Summary**

Increased understanding of specific causes of FLUTD has allowed diagnostic and therapeutic efforts to be directed toward identification and elimination of specific underlying disorders. The most common cause of FLUTD in cats < 10 years of age is feline idiopathic cystitis (FIC), followed by uroliths and urethral plugs. A diagnosis of FIC is made by excluding all other causes of FLUTD. In older cats (> 10 years), urinary tract infection and/or uroliths are the most common cause of FLUTD. It is imperative that veterinary technicians have a thorough understanding of FLUTD and the how the various treatments affect the different types of FLUTD.

Veterinary technicians play a critical role in the treatment of FLUTD. The history obtained from discussions with the owner aids in the diagnosis of FLUTD. The technicians' discussion of the treatment plan with the client is crucial to the client's understanding and compliance with the veterinarian's recommendation and ultimately the health of the pet.

### **References/Suggested Reading**

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