

Feline idiopathic cystitis:

Evidence-based management



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Initial management

Feline idiopathic cystitis (FIC) can be obstructive or non-obstructive in its presentation. There is little evidence to recommend a specific protocol for relieving obstruction in cats; smaller studies have shown no significant beneficial effects from administration of intravesical lidocaine¹ or glycosaminoglycans (GAG).² Urethral pressures have been reported to be increased in female cats with FIC compared with healthy cats, even when clinical signs were not overtly present.³ Therefore, there may be justification for administration of alpha antagonists, such as prazosin or phenoxybenzamine, in some cats with idiopathic urethral obstruction, but these drugs have not been formally investigated in male cats to prove or refute this statement. Pain appears to be a prominent feature of this disease and analgesics should be administered to help control these clinical signs. Once the cat has been stabilized, management is similar to the non-obstructed FIC cat, which can include analgesics, addressing the environmental needs of the cat, and possibly dietary and pharmacologic interventions.

While some cases of presumed FIC may appear to resolve quickly and not recur, the clinician should be aware that the patient's environmental needs are likely not being met and these issues should be addressed (see below). In addition to environmental alterations, analgesic therapy for initial management of lower urinary tract signs (LUTS) has been described with anecdotal success. As pain appears to be a clinical sign in cats with FIC, providing analgesia with narcotics such as oral buprenorphine (0.01 mg/kg transmucosal, squirted in the mouth PO q8–12h), butorphanol (0.2 mg/kg subcutaneously [SC] or PO q8–12h) or a fentanyl patch can be used, depending on the severity of the pain. Non-steroidal anti-inflammatory drugs (NSAIDs) have also been described for this disease, with variable results. To the author's knowledge, the only oral NSAID approved in the United States for use in cats is robenacoxib, and its use in FIC has not been described. Because of the risk for dehydration-associated reductions in blood flow to the kidneys and the potential for



acute kidney injury, these medications might increase the risk for adverse outcomes. Furthermore, they have not been found to benefit patients with interstitial cystitis/painful bladder syndrome (IC/PBS), an analogous disease in human beings, and are not routinely recommended. Unfortunately, evidence based data are lacking regarding these treatment options for the initial signs of FIC. It has been reported that many cats with LUTS do not have bacterial urinary tract infections,⁴ therefore antimicrobials should only be administered if there is confirmation of a positive urine culture.

Chronic management

Environmental alterations

No cure is currently available for cats with FIC; treatment options are aimed at clinical recovery, keeping the cat's clinical signs to a minimum, and increasing the disease-free intervals. Environmental stressors have been reported to exacerbate clinical signs of FIC. In cats with severe FIC, increased concentrations of circulating catecholamines have been reported compared with control cats during a period of mild stress.^{5,6} These catecholamines returned to baseline after periods of environmental enrichment. A recent study of healthy cats and cats with FIC found that environmental stressors resulted in increased number of sickness behaviors (eg, vomiting, lethargy, anorexia) in cats with FIC when the results were controlled for other factors.⁷ Due to these studies, environmental enrichment has been investigated in client-owned cats with FIC. In a non-placebo controlled trial, 46 client-owned cats with FIC were evaluated and multimodal environmental modifications (MEMO) therapy was found to be successful in most cats with FIC followed over a 1-year period.⁸ Placebo controlled trials are difficult when evaluating cats with FIC due to the waxing and waning nature of the disease as well as the numerous variables that one encounters in a home environment.

MEMO therapy involves obtaining a thorough environmental history, including but not limited to the topics presented in Table 1. A detailed client history form, as well as additional client and veterinarian resources can be found online at <http://indoorpet.osu.edu/veterinarians/research/index.cfm>. Furthermore, guidelines for meeting the environmental needs of cats has also recently been published by the *Journal of Feline Medicine and Surgery* and International Society for Feline Medicine working group.⁹ After the diagnosis of FIC is made, a thorough environmental history, as well as notation of all other co-morbidities present, needs to be obtained so the clinician (and/or staff member) can begin to tailor a plan to address all the needs of each individual cat. It is helpful to establish a veterinary technician/nurse-based program, in which a staff member works with these pet owners and patients as often as necessary to ensure the cat's problems are thoroughly explained to the owners so they understand the disease process enough to feel comfortable with managing their cat's disease.

The client should complete the questionnaire for all cats in the household and the clinician can then review the list and identify issues that may be contributing to the cat's clinical signs, including any

Table 1 Questionnaire to ascertain if the environmental needs of the cat are being met

- 1 Where was the cat obtained?
- 2 Number of cats in the household
 - Is intercat conflict an issue?
 - Number and type of other pets
 - Number of family members
- 3 Size and type of the household dwelling
- 4 Litter pans
 - Number?
 - How often are they cleaned?
 - How often are they changed?
 - Location in the house?
 - Type of litter used?
 - Depth of litter preferred by the cat?
- 5 Feeding
 - Type of food (including brand, canned versus dry)?
 - Location of bowls?
 - Food preferences?
 - Is competition for food present in the household?
- 6 Play and rest activity
 - Preferred toys?
 - Space in house available for play?
 - Preferred type of play?
- 7 Indoor or outdoor housing status?
- 8 Resting or hiding areas preferred?
- 9 Changes in household
- 10 Behavioral concerns
 - Aggression
 - Fear
 - Nervousness
 - Separation anxiety
- 11 Other sickness behaviors or co-morbid diseases present?

inter-cat conflict that may be present in multi-cat households. After the questionnaire has been completed, the veterinary technician/nurse can review it with the client and agree on helpful modifications.^{10,11} The author suggests recommending only one or two changes to the client initially so as not to overwhelm them or the cat. Meeting the environmental needs of the cat does not have to involve a large expense for clients (Figures 1a and b). Key resources to consider include water, food, litter boxes, interaction with humans and other animals (for some cats) and hiding/resting areas. It is important to make certain that proper litter box hygiene is followed and provide a structured MEMO plan.

Diet

Up to 90% of humans with IC/PBS report sensitivities to a wide variety of foods; however, these data were formulated primarily from questionnaire-based surveys.^{12,13} Sensitivities reported in humans include such foods as citrus fruits, alcohol, vitamin C and artificial sweeteners;



FIGURE 1 Examples of inexpensive environmental enrichment for cats. Proper resting (a) and hiding (b) areas for cats are important to provide a ‘safe’ area for all cats in the household. Environmental needs of the cat should be addressed for all cats in the household and clinicians also need to address inter-cat conflict if present. (Images courtesy of Dr Hazel Carney)

whereas, calcium glycerophosphate and sodium bicarbonate tended to improve clinical symptoms. Unfortunately, a specific diet does not alleviate symptoms for all IC/PBS patients; furthermore, dietary recommendations are confusing for clinicians if all the potential co-morbidities often encountered with IC are taken into consideration.^{14,15} For some human patients, tailored elimination diets are considered when developing a therapeutic plan.

Cats with FIC also have a variable combination of co-morbid disorders^{8,16–19} such as behavioral, endocrine, cardiovascular and gastrointestinal (GI) problems. Due to these findings, it is advised that the clinician complete a thorough physical examination as well as a detailed environmental history for cats suspected of FIC, and not focus entirely on the urinary bladder. That patients with FIC (and IC) have variable combinations of other co-morbid disorders raises the question as to why some cats present with primarily LUTS as their main clinical feature. However, all co-morbidities and the effect of diet must be considered when making recommendations for cats with FIC. Therefore, if the clinician is considering dietary changes for cats with FIC, a tailored approach to altering the cat’s diet is advised.

To date there are no published studies to support that acidified diets are beneficial in the management of chronic FIC; anecdotal evidence suggests that beverages that acidify the urine in human patients with IC/PBS can exacerbate clinical symptoms (<http://www.ichelp.org/>). There is also no evidence to support consuming a diet that produces urine with primarily an alkaline urinary pH benefits humans with IC/PBS. In cats, if pronounced struvite crystalluria is present in an obstructed male cat, a diet formulated for struvite dissolution may be warranted to help prevent recurrent urethral obstructions. Finally, obesity may be a risk factor for FIC, and implementing an obesity therapy program may be of benefit.²⁰ All the cat’s needs and concurrent diseases, if present, must be taken into consideration when making dietary and environmental recommendations.

Dietary moisture

An older study evaluating the recurrence of LUTS in cats with FIC that were fed a canned or dry formulation of the same diet revealed a significant reduction in the clinical signs in those cats

consuming the canned food.²¹ Increasing water intake by feeding canned food — or other methods, such as broths or automatic water dispensers²² — may or may not be beneficial for cats with FIC. Some hypothesize that added water might help dilute the potential ‘noxious’ stimulants in the urine such as urea and potassium chloride. Potassium chloride has been used as a diagnostic probe for IC/PBS in human beings,²³ and it has been speculated, but never demonstrated, that the urine potassium concentration plays a role in the pathophysiology of IC/PBS. For some cats, canned food or added dietary moisture in the forms described above may serve as a form of environmental enrichment (eg, increased contact with humans who provide the food on differences in mouth feel/texture for the cat), which might have a positive impact on the cat’s clinical signs.

Pheromones

Pheromones are chemical substances that transmit highly specific information among animals of the same species. Although the exact mechanisms of action are unknown, pheromones reportedly induce changes in the limbic system and hypothalamus that alter the emotional state of the animal. Feliway (Ceva Animal Health, St Louis) is the synthetic F3 fraction of the naturally occurring feline facial pheromone. Treatment with this pheromone has been reported to reduce the amount of anxiety experienced by cats in unfamiliar circumstances, a response that may or may not²⁴ be helpful for FIC cats and others that experience anxiety-related problems.²⁵ In a pilot study evaluating Feliway in cats with FIC, a decrease in the number of days they exhibited clinical signs was reported, although this finding was not significant ($P = 0.06$).²⁶ Feliway can be purchased as a spray formulation or a room diffuser. The spray can be used in areas such as where the litter pan is kept, or sprayed in carriers 10 to 15 minutes prior to car transport. Room diffusers can be placed in designated rooms for cats and may help decrease anxiety and clinical signs of FIC.⁹

Drug therapy

A variety of drugs have been tried in cats with FIC (Table 2), but prospective, randomized, properly masked, placebo-controlled studies are lacking to confirm their clinical efficacy. If MEMO (and possibly pheromone) therapy fails to control signs,

Table 2 Drug therapy for chronic feline idiopathic cystitis*

Drug	Class/action	Dosage	Potential side effects
Amitriptyline	Tricyclic antidepressant	2.5–5 mg/cat q12–24h	Sedation Lethargy Urine retention
Buspirone	Non-benzodiazepine anxiolytic	2.5–5.0 mg/cat q12h	Sedation
Clomipramine	Tricyclic antidepressant	0.25–0.5 mg/kg q24h	Sedation Lethargy Urine retention
Fluoxetine	Serotonin reuptake inhibitor	1mg/kg PO, q24h	Gastrointestinal upset
Glycosamino-glycans	May coat urinary bladder lining and protect uroepithelium from noxious substances	50 mg/cat PO, q12–24h (Elmiron)	Rarely gastrointestinal upset
*Controlled clinical studies evaluating use of these drugs are limited			

the medications listed in Table 2 can be considered. These drugs should not be used for cats on initial presentation for care of LUTS; they should be considered only for cats after their environmental needs have been addressed, and should not be discontinued abruptly.

Amitriptyline (2.5–7.5mg/cat PO q 24h), a tricyclic antidepressant (TCA), was evaluated in an open, non-placebo controlled trial and appeared to help clinical signs in some cats with severe, refractory FIC.²⁷ This drug, or possibly clomipramine, another TCA (0.25–0.5mg/kg PO q24h), may need to be administered for at least one week or longer before a beneficial effect may be noted. If no improvements are noted, or medicating the cat is too stressful (for owner or cat), these drugs should be gradually discontinued over 1 to 2 weeks. Side effects of the TCAs can include sedation, lethargy, weight gain and urine retention. Due to the possibility of urine retention, it is advised to monitor the cat for urolithiasis if clinical signs re-develop after receiving this class of drugs for an extended period of time. Fluoxetine (1 mg/kg PO q24h) is a selective serotonin reuptake inhibitor (SSRI) and has been shown to decrease signs of urine marking in cats; however, its effects in cats with FIC have not been described.²⁸ This drug should also not be abruptly discontinued. Side effects of the SSRI's can include behavior changes such as anxiety, and sleep disturbances. Many drugs used for FIC are considered 'off-label' and owner consent should be obtained prior to therapy.

Pentosan polysulfate sodium is a semi-synthetic carbohydrate derivative similar to GAGs that is also approved for humans with IC. A multi-centered, placebo-controlled, masked study in cats reported no significant differences when comparing pentosan polysulfate sodium with placebo.²⁹ However, all groups had clinical benefit, suggesting a strong 'placebo' effect. All medication was provided to the cat in a food treat; the authors of

this study hypothesized that improving the interaction and environmental needs of the cat may inadvertently have contributed to the positive outcomes noted in all groups. Similar findings were reported in two other studies evaluating GAG replacers in cats with FIC.^{30,31}

Summary

The clinician and client must understand that FIC is not limited to abnormalities solely of the urinary bladder. Because FIC can be a chronic condition in some cats, excellent client communication in conjunction with MEMO therapy, and possibly pharmacologic agents, may be beneficial for managing chronic FIC. Some cats may retain their underlying predisposition for this disorder and, if exposed to a significant stressor, clinical signs can recur. Early intervention can be important and research in both rodents³² and cats^{5,8} has demonstrated that effective environmental enrichment might mitigate much of the effects of early life adversity. Analgesics can be used short-term if the cat is presented with recurrent clinical signs. Continual work with the owner and cat can yield positive results, and encouragement to reinforce these behaviors during successes can be beneficial, as is the case with any chronic medical condition.

References

- 1 Zezza L, Reusch CE, Gerber B. Intravesical application of lidocaine and sodium bicarbonate in the treatment of obstructive idiopathic lower urinary tract disease in cats. *J Vet Intern Med* 2012; 26: 526–531.
- 2 Bradley AM, Lappin MR. Intravesical glycosaminoglycans for obstructive feline idiopathic cystitis: a pilot study. *J Feline Med Surg* 2014 (In press)
- 3 Wu CH, Buffington CA, Fraser MO, et al. Urodynamic evaluation of female cats with idiopathic cystitis. *Am J Vet Res* 2011; 72: 578–582.
- 4 Buffington CA, Chew DJ, Kendall MS, et al. Clinical evaluation of cats with nonobstructive urinary tract diseases. *J Am Vet Med Assoc* 1997; 210: 46–50.
- 5 Westropp JL, Kass PH, Buffington CA. Evaluation of the effects of stress in cats with idiopathic cystitis. *Am J Vet Res* 2006; 67: 731–736.
- 6 Westropp JL, Kass PH, Buffington CA. In vivo evaluation of alpha₂-adrenoceptors in cats with idiopathic cystitis. *Am J Vet Res* 2007; 68: 203–207.
- 7 Stella JL, Lord LK, Buffington CA. Sickness behaviors in response to unusual external events in healthy cats and cats with feline interstitial cystitis. *J Am Vet Med Assoc* 2011; 238: 67–73.
- 8 Buffington CA, Westropp JL, Chew DJ, et al. Clinical evaluation of multimodal environmental modification (MEMO) in the management of cats with idiopathic cystitis. *J Feline Med Surg* 2006; 8: 261–268.
- 9 Ellis SL, Rodan I, Carney HC, et al. AAFP and ISFM feline environmental needs guidelines. *J Feline Med Surg* 2013; 15: 219–230.
- 10 Herron ME, Buffington CA. Environmental enrichment for indoor cats. *Compend Contin Educ Vet* 2010; 32: E4.
- 11 Herron ME, Buffington CA. Environmental enrichment for indoor cats: implementing enrichment. *Compend Contin Educ Vet* 2012; 34: E3.
- 12 Shorter B, Lesser M, Moldwin RM, et al. Effect of comestibles on symptoms of interstitial cystitis. *J Urol* 2007; 178: 145–152.

- 13 Bassaly R, Downes K, Hart S. Dietary consumption triggers in interstitial cystitis/bladder pain syndrome patients. *Female Pelvic Med Reconstr Surg* 2011; 17: 36–39.
- 14 Rodriguez MA, Afari N, Buchwald DS, et al. Evidence for overlap between urological and non-urological unexplained clinical conditions. *J Urol* 2009; 182: 2123–2131.
- 15 Erickson DR, Morgan KC, Ordille S, et al. Non-bladder related symptoms in patients with interstitial cystitis. *J Urol* 2001; 166: 557–561; 561–552.
- 16 Buffington CA. Co-morbidity of interstitial cystitis with other unexplained clinical conditions. *J Urol* 2004; 172: 1242–1248.
- 17 Buffington CA, Westropp JL, Chew DJ. A case-control study of indoor-housed cats with lower urinary tract signs. *J Am Vet Med Assoc* 2006; 228: 722–725.
- 18 Buffington CA. External and internal influences on disease risk in cats. *J Am Vet Med Assoc* 2002; 220: 994–1002.
- 19 Freeman LM, Brown DJ, Smith FW, et al. Magnesium status and the effect of magnesium supplementation in feline hypertrophic cardiomyopathy. *Can J Vet Res* 1997; 61: 227–231.
- 20 Michel K, Scherk M. From problem to success: feline weight loss programs that work. *J Feline Med Surg* 2012; 14: 327–336.
- 21 Markwell PJ, Buffington CA, Chew DJ, et al. Clinical evaluation of commercially available urinary acidification diets in the management of idiopathic cystitis in cats. *J Am Vet Med Assoc* 1999; 214: 361–365.
- 22 Grant DC. Effect of water source on intake and urine concentration in healthy cats. *J Feline Med Surg* 2010; 12: 431–434.
- 23 Parsons CL, Greenberger M, Gabal L, et al. The role of urinary potassium in the pathogenesis and diagnosis of interstitial cystitis. *J Urol* 1998; 159: 1862–1867.
- 24 Frank D, Beauchamp G, Palestrini C. Systematic review of the use of pheromones for treatment of undesirable behavior in cats and dogs. *J Am Vet Med Assoc* 2010; 236:1 308–1316.
- 25 Griffith CA, Steigerwald ES, Buffington CA. Effects of a synthetic facial pheromone on behavior of cats. *J Am Vet Med Assoc* 2000; 217: 1154–1156.
- 26 Gunn-Moore DA, Cameron ME. A pilot study using synthetic feline facial pheromone for the management of feline idiopathic cystitis. *J Feline Med Surg* 2004; 6: 133–138.
- 27 Chew DJ, Buffington CA, Kendall MS, et al. Amitriptyline treatment for severe recurrent idiopathic cystitis in cats. *J Am Vet Med Assoc* 1998; 213: 1282–1286.
- 28 Hart BL, Cliff KD, Tynes VV, et al. Control of urine marking by use of long-term treatment with fluoxetine or clomipramine in cats. *J Am Vet Med Assoc* 2005; 226: 378–382.
- 29 Chew DJ, Bartges JW, Adams LG, et al. Randomized, placebo-controlled clinical trial of pentosan polysulfate sodium for treatment of feline interstitial (idiopathic) cystitis. *J Vet Int Med* 2009; 23: 690 (abstract)
- 30 Gunn-Moore DA, Shenoy CM. Oral glucosamine and the management of feline idiopathic cystitis. *J Feline Med Surg* 2004; 6: 219–225.
- 31 Wallius BM, Tidholm AE. Use of pentosan polysulphate in cats with idiopathic, non-obstructive lower urinary tract disease: a double-blind, randomised, placebo-controlled trial. *J Feline Med Surg* 2008; 11: 409–412.
- 32 Russo SJ, Murrough JW, Han MH, et al. Neurobiology of resilience. *Nat Neurosci* 2012; 15: 1475–1484.