

“Interstitial Cystitis” in Cats: Environmental Enrichment and Nutrition

C.A. Tony Buffington, DVM, PhD, DACVN

The Ohio State University, Veterinary Hospital, Columbus, Ohio



“Interstitial cystitis” is a misnomer (a discussion of which is beyond the scope of this article). Recent research has led to a reconceptualization of the syndrome in both humans and domestic cats, in which it has been referred to as “feline interstitial cystitis” (FIC). The identification of multiple, complex abnormalities of the nervous and endocrine systems¹ and the recognition of the presence of a range of comorbid disorders in affected cats² suggest that the bladder is more likely to be a victim rather than the perpetrator of the syndrome. Enhanced central noradrenergic drive in the face of inadequate adrenocortical restraint seems to be associated with the disease process.

These systems appear to be driven by increased hypothalamic corticotropin-releasing factor release by a sensitized stress response system,³ which may represent the result of a developmental accident or early adverse experience.⁴ Treatment strategies that reduce the intensity of central efferent drive appear to help reduce clinical signs in cats with this syndrome,⁵ whereas those that do not address this aspect of the disease seem to be less effective.

Just as increased water is primary therapy for all urinary stone disease, plus other treat-

ments based on the specific mineral composition of each patient’s stone when water alone is not enough, environmental enrichment may

be primary therapy for FIC (and related comorbidities).⁶ This opinion is based on the descriptions of the neuroendocrine abnormalities suffered by cats with FIC, clinical research, and experience.^{2,5} Environmental enrichment means provision of all necessary resources, control of interactions with owners, a tolerable intensity of conflict with other cats in the household, and thoughtful institution of change.

KEY POINTS

- Environmental enrichment means provision of all necessary resources, control of interactions with owners, a tolerable intensity of conflict with other cats in the household, and thoughtful institution of change.
- Our clinical experience suggests that a change in food also may be associated with recurrence of lower urinary tract signs in some patients.

A resource list for indoor cats includes:⁷

- Informed owners
- Food and water
- Toilet
- Scratching objects
- Resting areas
- Windows and climbing opportunities.

FOCUS ON NUTRITION AND FIC

For years, it has been assumed that an improperly formulated diet is a primary cause of naturally occurring lower urinary tract signs (LUTS) in cats, but little evidence supports this hypothesis. In one study, we collected diet histories from 109 owners of cats presented with LUTS.⁸ These histories revealed that 94% of the cats were fed one or more nationally advertised cat foods, with all major U.S. brands represented. Forty-one cats were given only dry food, 3 cats were fed only canned food, and 26 cats were fed more than one type of food. No cats were fed semimoist food exclusively. Six cats were fed only canned food marketed to treat or prevent struvite urolithiasis and 18 cats were fed only dry veterinary foods of this type. Compared with results from U.S. household surveys, cats with LUTS were significantly ($P < 0.0001$) more likely to eat dry food exclusively.

If eating dry food increases the risk of FIC, a variety of factors could be involved. Diet-related decreases in urine water and/or magnesium and/or increases in urine calcium, potassium, and/or hydrogen ion concentrations all could influence activity of sensory nerve fibers in the urothelium. We recently found that only 11% of cats fed canned food designed to result in production of an acidic urine suffered another episode of LUTS during a year of feeding, compared with 39% of cats fed the dry form ($P < 0.05$).⁹ These results suggest that increased water intake may be important in more than one of the lower urinary tract disorders. The reasons for this effect remain to be determined; the nutrient and ingredient content of the food, hedonic aspects, and feeding behavior also might explain the differences.

Our clinical experience suggests that a change in food also may be associated with recurrence of LUTS in some patients. Years ago, only one veterinary food marketed for treatment of struvite urolithiasis and prevention of LUTS was available. Not only did signs often resolve when cats were given this food, but also many clinicians observed that signs recurred when the cats were switched to other foods. It was subsequently observed that in some cats signs often resolve for a time regardless of treatment. Moreover, with the advent of

many similarly formulated veterinary and commercial foods marketed for use in cats with LUTS, the reverse also has been seen, ie, signs sometimes recur when cats are switched from any one of these foods to another.¹⁰

This occurrence suggests that the food change rather than the new food can result in recurrence of signs. This hypothesis is strengthened by the observation that some cats with LUTS appear to be unusually sensitive to a variety of environmental stimuli.¹¹ This sensitivity can even complicate diagnosis of the cause of the signs. We recently reported our experience with a cat with a urine pH of 6.1 at home that rose to 7.6 during transport to our hospital. Having ruled out the known causes of such a urine pH—diet, urinary tract infection, and renal tubular acidosis, we concluded that stress was most likely responsible for the change in urine pH.¹² We subsequently have documented that cats with this syndrome are unusually susceptible to stressors.¹¹

Behavioral research suggests that cats prefer to eat individually in a quiet location where they will not be startled by other animals, sudden movement, or sudden activity such as an air duct or appliance that may operate unexpectedly.¹³ Canned food may be preferable for cats with FIC due to the increased water content or a more natural “mouth feel” but some cats and some owners may prefer dry foods, so I recommend food changes only if both the client and the cat agree to the change. I think food changes may increase a cat’s perception of threat, to the point of causing recurrence of clinical signs, so I recommend that food be changed in a way that cats can choose between the new and original foods. New foods can be offered in a separate container next to the usual food so the cat can choose. (This is how pet food manufacturers assess food preferences.)

Feeding behavior also includes predatory activities. These may be simulated by hiding small amounts of food around the house or putting dry food in a container from which the cat has to extract individual pieces of food or move something to release the food pieces, if such interventions appeal to the cat.

Cats also seem to have water preferences. Differences in response to changes in freshness, taste, movement (water fountains, dripping faucets, or aquarium pump-bubbled air into a bowl), and shape of container (some cats seem to resent having their vibrissae touch the sides of the container when drinking)

For years, it has been assumed that an improperly formulated diet is a primary cause of naturally occurring lower urinary tract signs (LUTS) in cats, but little evidence supports this hypothesis.

all can be investigated. Food and water bowls should be cleaned regularly unless individual preference suggests otherwise.

More suggestions and examples of other resources are available in many excellent publications and on our Web site at www.vet.ohio-state.edu/indoorcat.htm. I recommend that environmental modifications be instituted slowly, one at a time, in a way that permits the cat to express its like or dislike for the change. In multiple cat households, I suggest extending the “1+1” rule traditionally applied to litter boxes (1 for each cat in the home, plus 1) to all pertinent resources (particularly food, water, and litter containers) in the household. Many, maybe most, cats can survive perfectly well by accommodating to less than perfect surroundings. The cats we treat, however, do not seem to have the adaptive capacity of healthy cats and may be considered a separate population with greater needs. We are concerned more with optimizing the environments of indoor cats rather than identifying minimum requirements for survival.

Behavioral research suggests that cats prefer to eat individually in a quiet location where they will not be startled by other animals, sudden movement, or sudden activity such as an air duct or appliance that may operate unexpectedly.

Once clients have identified areas for improvement in resource availability, they may need coaching through the process and help to institute the changes. This time-consuming activity can be delegated to effective technicians.

SUMMARY

Recent evidence supports the hypothesis that idiopathic LUTS are more likely to result from a disease affecting the

bladder, as well as other organs, than from a bladder disease. Our observations that modifications have a beneficial effect on intestinal and behavioral signs in addition to LUTS⁵ suggest that changes in the form, environment, and presentation of food may influence the appearance of LUTS.

REFERENCES

1. Buffington CAT. Comorbidity of interstitial cystitis with other unexplained clinical conditions. *J Urol* 172:1242–1248, 2004.
2. Buffington CAT, Westropp JL, Chew DJ, et al. A case-control study of indoor-housed cats with lower urinary tract signs. *J Am Vet Med Assoc* 228:722–725, 2006.
3. Fenton BW. Limbic associated pelvic pain: A hypothesis to explain the diagnostic relationships and features of patients with chronic pelvic pain. *Med Hypotheses* doi:10.1016/j.mehy.2006.12.025, 2007.
4. Gluckman PD, Hanson MA. Developmental origins of disease paradigm: A mechanistic and evolutionary perspective. *Ped Res* 56:311–317, 2004.
5. Buffington CAT, Westropp JL, Chew DJ, et al. Clinical evaluation of multimodal environmental modification in the management of cats with lower urinary tract signs. *J Feline Med Surg* 8:261–268, 2006.
6. Buffington CAT. External and internal influences on disease risk in cats. *J Am Vet Med Assoc* 220:994–1002, 2002.
7. Westropp JL, Buffington CAT. Feline idiopathic cystitis: Current understanding of pathophysiology and management. *Vet Clin North Am Small Anim Pract* 34:1043–1055, 2004.
8. Buffington CA, Chew DJ, Kendall MS, et al. Clinical evaluation of cats with nonobstructive urinary tract diseases. *J Am Vet Med Assoc* 210:46–50, 1997.
9. Markwell PJ, Buffington CAT, 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* 214:361–365, 1999.
10. Buffington CAT. Unpublished observations.
11. Westropp JL, Kass PH, Buffington CAT. Evaluation of the effects of stress in cats with idiopathic cystitis. *Am J Vet Res* 67:731–736, 2006.
12. Buffington CA, Chew DJ. Intermittent alkaline urine in a cat fed an acidifying diet. *J Am Vet Med Assoc* 209:103–104, 1996.
13. Masserman JH. Experimental neuroses. *Sci Am* 182:38–43, 1950.

This article, as well as further information on the topic, is available on the Web at www.HillsVet.com/ConferenceProceedings.