



*To PU or not to PU?  
Is that the Question?*

**Cats and FLUTD**

UNIVERSITY OF CALGARY  
FACULTY OF VETERINARY MEDICINE

Serge Chalhoub DVM, DACVIM (SAIM)






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**On the Menu**

1. **What is FLUTD?**
  - Syndrome definition
  - Feline idiopathic cystitis
  - UTIs, stones, plugs, neoplasia
2. **FLUTD Diagnosis**
3. **Treatment: Evidence-based?**
  - Acute
  - Chronic
  - Males vs. females
  - Perineal urethrostomy
4. **Prognosis**

TRUE NORTH  
VETERINARY DIAGNOSTICS  
Thank you!!!


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Poll: What to do next for Stanley?

**Stanley The Grump**

5y.o MN DSH

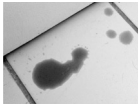

- Owner away for 3 days
- 8h of doing this
- Ate a little
- No previous medical history



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**1. What is FLUTD?**


- **Feline lower urinary tract disease (FLUTD)**
  - Any disorder affecting bladder or urethra of cats (males and females)
    - Multiple other names
  - Regardless of cause, common clinical signs
    - Hematuria, stranguria, dysuria, pollakiuria, inappropriate urinations, vocalizing, hiding

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**FLUTD**


- **FLUTD is a syndrome**
  - Does not define:
    - Who?
    - Where?
    - What?
- **2/3 of cats will not have a specific diagnosis**
  - What exactly does that mean?



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**A GLOBAL PATIENT APPROACH IS IMPORTANT**

FLUTD is a multifactorial and systemic syndrome



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Poll: What is the most common lower urinary tract stone in cats?

## FLUTD Causes

Etiology	Percentage of cases	Notes
Feline Idiopathic Cystitis (FIC)	55-69%	Most common cause by far
Urolithiasis (lower urinary tract stones)	12-22%	Calcium oxalate, struvite, urate, other
Urethral plugs	10-21%	Mixture of struvite crystals + debris/mucus
Anatomical abnormalities	10%	Strictures, congenital
Behavioral issues	9%	Related to FLUTD?
UTIs	1.5-20%	Benign bacteriuria?
Neoplasia	0.3-3.6%	Carcinoma bladder, urethra
Ureteroliths, renoliths	???	Underestimated

- FLUTD AFFECTS BOTH males and females
- ALL of these causes CAN potentially cause urethral obstruction in male cats

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## Those Males and Their Darn Urethras...

- Urethral obstruction much more common in males with any FLUTD cause
  - 15-57% FIC males
  - 20-67% urolithiasis males

HF's Atlas of Veterinary Clinical Anatomy | <https://petfoodshop.com/blog/news/urinary-health-of-cats>

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## FLUTD: Pathophysiology

- **Urolithiasis**
  - Struvite usually not associated to infections
  - Change in prevalence unclear
- **Urethral plugs**
  - Struvite crystals with protein matrix
  - Secondary to FIC? Submission helpful!

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## Stone Type CVUC 1998-2014

## Stone Type CVUC 2018

Legend: CaOx, Struvite, Urate, Other

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## Feline Idiopathic Cystitis

**“Interstitial Cystitis” naming in cats because of multiple similarities with Bladder Pain Syndrome**

But... is it accurate to call it a cystitis?  
Likely more of an anxiopathy

The Central Stress Response System

<https://todayveterinarypractice.com/feline-medicine-pandora-syndrome-in-cats-diagnosis-and-treatment/>

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## More About Inflammation?

Journal of Veterinary Internal Medicine | **ACVIM** | **Cytokine Activity**

*Brief Communication*  
J. Vet. Intern. Med. 2018;32(2):279

Serum Cytokine Profiling in Cats with Acute Idiopathic Cystitis

M. Parry (1), V. Yarballyan-Gurkan, and J.M. Kruger

- Increased serum concentrations of pro-inflammatory cytokines and chemokines in 12 acute FIC cats vs. control cats
  - No biopsies, small number of cats

**Inflammation and Tissue Remodeling in the Bladder and Urethra in Feline Interstitial Cystitis**

*F. Aure Kullmann (1), Brongniat M. McDonnell (1), Amanda S. Wolf-Johnston (1), Andrew M. Lynn (1), Daniel Ogden (1), Samuel G. Gonzalez (1), Wendy Shaw (1), Hana V. Zabolovna (1), Yousef Nadeh (1), Anthony J. Kane (1), James H. Rossato (1), Shoshan I. Bostack (1), Gerard Ammend-DuBois (1), Steve Kaufman (1), Gerardo A. Barajas (1)*

- Cats with FIC are similar to non-ulcerative FIC/BPS
  - Bladder lamina propria, urethra: increased degranulated mast cells, leukocytes, COX expression, tissue remodeling
- Tissue remodeling = may alter sensory network of mucosa (nerves, muscles, epithelium) = altered sensations and pain

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### Less About Inflammation?

**Sculptoreaunu et al 2005:** Bladder sensory neurons in FIC cats have increased excitability to physical and chemical stimuli

**Buffington 2011:** FIC clinical signs wax and wane and somewhat worsened by internal and external stressors

**Birder et al 2011:** Humans with BPS often share symptoms with other pain disorders and cats as well; also comorbid disorders

**Stella et al 2011:** Environmental stressors resulted in increased # illness behaviours in FIC vs. healthy cats

**Treatment strategies that decrease the central stress response system reduce signs of FIC (multiple studies)**

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### Less of an Inflammatory Bladder Disease, More of a Systemic Inappropriate Response Syndrome

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Epidemiology	FIC
Obesity	<b>Pathophysiology</b> Decreased GAG excretion Histologic changes (mast cells, submucosal hemorrhage) Increased bladder permeability Viral etiology? Unlikely; (Lund et al, JFMS 2012) Non ulcerative changes Cytokines Increased hypothalamic CRF
Anxiety, threat response	
Frequent diet change	
Genetic	
Age? Reproductive status?	
Indoor	
Non-clumping litter	
Multi-cat household	
Lack of play/climbing	
Humans?	

**Increased hypothalamic CRF release leading to enhanced central noradrenergic drive**

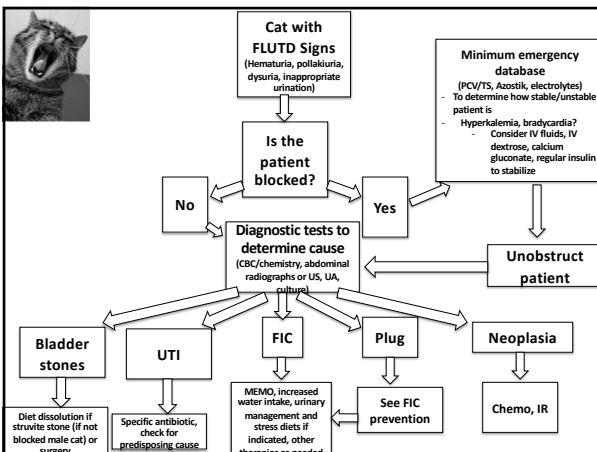
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Poll: What do we do next for Stanley?

## 2. Diagnosis

- As you've just seen, many different causes of FLUTD
- Important to rule out causes because treatments will differ
- Diagnostics:
  - MEDB
  - Urinalysis +/- culture
  - Medical imaging
    - Or treat as FIC and see?

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## Medical Imaging

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## FLUTD: Diagnosis



- CBC**
  - Usually nonspecific changes
- Chemistry panel**
  - Often normal
  - If urethral obstruction: azotemia possible
  - Some cats will develop hepatic lipidosis
  - Look for hypercalcemia
- Urinalysis**
  - Often active sediment
    - WBCs, blood, mucus/cellular debris, crystals (struvite)
  - Active sediment does not always mean UTI
  - Crystals does not always indicate stones
- Urine culture**
  - Indicated if bacteriuria
  - Post catheterization also

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## Urinalysis

*Journal of Feline Medicine and Surgery*  
Volume 26(1) 2012  
Pages 46-50  
doi:10.1053/j.jfms.2011.11.004  
© 2012 Elsevier Inc.

**Evaluation of urinalyses from untreated adult cats with lower urinary tract disease and healthy control cats: predictive abilities and clinical relevance**

Heidi Sjötte Lund, Randi Ingeborg Krontveit, Ingvild Halvorsen and Anna Vigdis Eggertsdóttir

- Increased BW, urine RBCs, epithelial cells associated with increased FLUTD odds**
  - Bacterial sediment and subjective grading only moderate in predicting bacterial growth
  - No significant differences in etiologies
  - WBC excluded; age not a factor**

### Hematuria, but not significant pyuria with FIC

*Journal of Feline Medicine and Surgery*, 20(9) 21, 1023-1028

- UTI in FLUTD cats more common in female cats, cats >10yo, Abyssinians**
- Bacteriuria has unknown significance**
  - UTI + comorbidity in 75-85% of cases (CKD, endocrinopathies)

**URINARY TRACT INFECTION AND SUBCLINICAL BACTERIURIA IN CATS**  
**A clinical update**

Roswitha Dorsch, Svenja Teichmann-Knorrn and Heidi Sjötte Lund

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## Bacteriuria

*Journal of Feline Medicine and Surgery* 20(7) 4, 403-407  
doi:10.1053/j.jfms.2007.06.008

**Bacteriuria in cats with feline lower urinary tract disease: a clinical study of 134 cases in Norway**

Anna V. Eggertsdóttir DVM, PhD<sup>1</sup>, Heidi S. Lund DVM<sup>1</sup>, Randi Krontveit DVM<sup>1</sup>, Henning Sorum DVM, PhD<sup>2</sup>

- 134 FLUTD cats; 37% UO, 63% non UO**
  - 33% bacteriuria (vs. 2%-15% in other studies (but mostly teaching hospitals))
  - 18% were older cats but did not have concurrent disease

**Take-Away Points**

- Urinalysis important**
- Culture if needed**
- And being overweight is a risk factor**


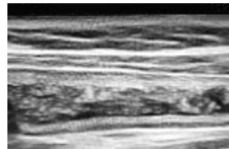
**Occurrence of bacteriuria in 18 catheterised cats with obstructive lower urinary tract disease: a pilot study**

Marine Hugonard<sup>1,2</sup>, Karine Chalvet-Monfray<sup>1,4</sup>, Jérémy Demis<sup>1</sup>, Céline Pouzol-Nevores<sup>1</sup>, Anthony Barthélémy<sup>1,4</sup>, Jacqueline Valiard<sup>1</sup> and Isabelle Goy-Thollot<sup>1,4</sup>

- 18 males, 48h catheterization**
- 1/3 developed bacteriuria**
  - Bacteriuria predictive of positive urine culture
  - Culture of catheter tip not useful

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## 3. Treatment

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## FLUTD Treatments: Depends on the Cause and Phase (Acute vs. Prevention Phase)

- Bladder Stones (males + females):**
  - Hard to tell if struvite (potential to dissolve with diet) or CaOx (will not dissolve)

**Efficacy of two commercially available, low-magnesium, urine-acidifying dry foods for the dissolution of struvite uroliths in cats**

JAVMA, Vol 243, No. 8, October 15, 2013  
Jody P. Lulich, DVM, PhD, DACVIM; John M. Kruger, DVM, PhD, DACVIM; Jennifer M. MacLeay, DVM, PhD, DACVIM; Jane M. Merrills, DVM, DABVP; Inke Paetani-Robinson, PhD; Hasan Abbasan, DVM, PhD; Carl A. Osborne, DVM, PhD, DACVIM

**Diet A (specific struvite dissolution diet) took 13 days to dissolve struvite stones in cats vs. 27 days for urinary management diet**

**But struvite dissolution diet CANNOT be fed long term; advantage to feed other urinary diets**

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## FLUTD Treatments: Depends on the Cause and Phase (Acute vs. Prevention Phase)

- Bladder Stones (males + females):**
  - 17 cats on urinary management diet; 8 wet, 9 dry
  - Struvite dissolution median 18 days (10-55)**
    - 4 cats failed; analysis showed CaOx or CaPh
  - More evidence: 2019 study on SO Calm <1 week for dissolution in dissolving struvite stones in vivo**

Doreen M. Houston<sup>1\*</sup>, Heather E. Weese<sup>1</sup>, Michelle D. Evason<sup>1</sup>, Vincent Biourge<sup>2</sup> and Ingrid van Hoek<sup>1</sup>

Jody P. Lulich, DVM, PhD, DACVIM; John M. Kruger, DVM, PhD, DACVIM; Jennifer M. MacLeay, DVM, PhD, DACVIM; Jane M. Merrills, DVM, DABVP; Inke Paetani-Robinson, PhD; Hasan Abbasan, DVM, PhD; Carl A. Osborne, DVM, PhD, DACVIM


**Diet A (specific struvite dissolution diet) took 13 days to dissolve struvite stones in cats vs. 27 days for urinary management diet**

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## FIC Acute Treatments

**85% resolve in 5-7 days**



**Either hospitalized or at home**


1. Fluids (IV, SQ)
  - Hydration, "dilute" debris
2. Pain control (opioids)
  - THEY ARE IN PAIN
  - NSAIDS DO NOT WORK
3. Appetite stimulation, nausea control
  - LET THEM EAT WHAT THEY WANT
4. Prazosin (Alpha-adrenergic blockers)
  - Reduces urethral spasms????
5. Environment
  - Reduce stress, provide safe place

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## Males and Urethral Obstruction

- **Reduce urethral trauma when unblocking**
  - Smaller French catheter (such as 3.5Fr) for indwelling, this may reduce recurrence of immediate re-obstruction
  - Harder catheterization: more likely to rUO
  - Should we flush the bladder?
    - Dorsey et al 2019 JAVMA: no difference
- **Urinary catheter duration**
  - >24h but usually < 36h
  - Clear urine at catheter removal?
    - Seitz et al 2018 JAVMA
- **Prazosin for 7 days...**

**Initial treatment factors associated with feline urethral obstruction recurrence rate: 192 cases (2004–2010)**  
JAVMA 2013  
 Peter F Henrick, DVM, and Elizabeth B. Davidson, DVM, DACVECC



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## Let's Chat Prazosin

Journal Article

Effect of prazosin on feline recurrent urethral obstruction

Kayla R Hanson, Elise Rudloff, Lingnan Yuan, Jonathan P Moschel, Andrew K Lindaker  
 Journal of Feline Medicine and Surgery 2021, 25 (12): 1176-1182

- Prazosin 0.5mg q12h for 7 days vs. placebo, recurrence rate within 30 days
- 65 cats, 16 (25%) had rUO
  - Of those 16, five were placebo and 11 on prazosin
  - No significant difference in reoccurrence rate

**JAVMA** JUNE 2022 | VOL. 260 | NO. S2 **AVMA**

**Prazosin administration increases the rate of recurrent urethral obstruction in cats: 388 cases**


Diana S. Connors, DVM; Elizabeth A. Rozanski, DVM; Anna S. Wayne, DVM, MS; David S. Connors, DVM; Elizabeth A. Rozanski, DVM; Anna S. Wayne, DVM, MS  
 Division of Critical Care, Department of Clinical Services, Cummings School of Veterinary Medicine, Tufts University, North Grafton, MA

- 388 cats, prazosin 0.5-1mg q12h for 14 days, observational study
- 302 received prazosin, 86 did not
  - 11% prazosin and 6% others had rUO, prazosin did not decrease risk
  - Within 14 days, higher association prazosin cats having rUO vs. others (24% vs. 13%)
- Gritty urethra associated with higher rUO (but flushing may not help)

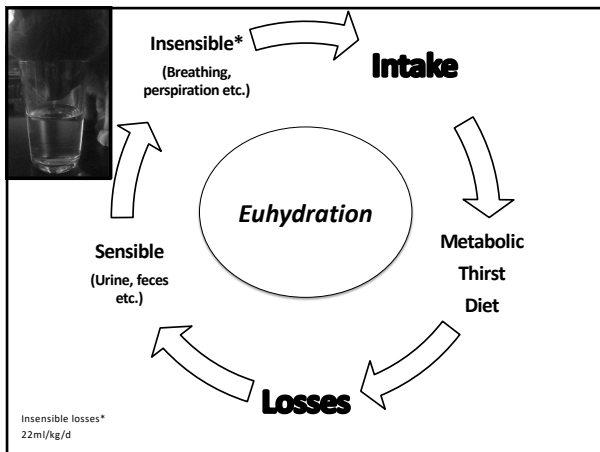
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## Males and Urethral Obstruction

- **Monitoring**
  - Urine Output Production (UOP)
    - Minimum 1-2 ml/Kg/hr
    - Leave catheter until urine "clears" up?
    - Empty bag every 4h and calculate ins/outs
  - After urinary catheter placement: Post obstructive diuresis can occur
    - UOP may be much more than 1-2ml/Kg/hr
    - Patients may become hypokalemic, hypoperfused, dehydrated, lethargic



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## Males and Urethral Obstruction

- **Monitoring**
  - UOP q4h
  - BP q12h
  - Body weight q8h
  - Appetite
  - Electrolytes q12h
  - Blood glucose if gave insulin for hyperkalemia
  - Creatinine q24h

**Retrospective evaluation of presenting temperature of urethral obstructed male cats and the association with severity of azotemia and length of hospitalization: 243 cats (2006–2009)**  
(J Vet Emerg Crit Care 2012; 22(3): 347-354)  
 Mitchell Fells, DVM and Lee V. Henold, DVM, DACVECC

**Azotemia entails longer hospitalization**



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## M Declined unblocking or \$\$\$\$? on

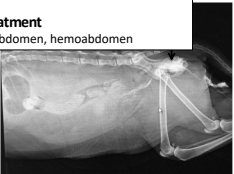
### A protocol for managing urethral obstruction in male cats without urethral catheterization

Edward S. Cooper, VMD, MS, DACVECC; Tammy J. Owens, DVM; Dennis J. Chew, DVM, DACVIM; C. A. Tony Buffington, DVM, PhD, DACVN

- Excluded cats with stones
- Acepromazine, buprenorphine, medetomidine, decompressive cystocentesis, SC fluids
- Dark quiet room 72h
- 11/15 cats successful treatment
- Failure: azotemia, uroabdomen, hemoabdomen

– Blood glucose if gave insulin for hyperkalemia

– Creatinine q24h

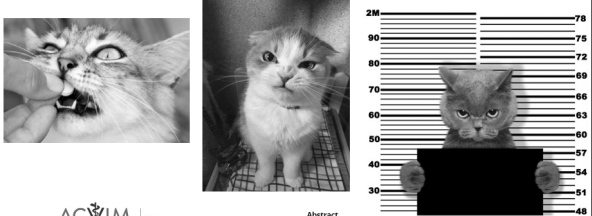


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## FIC Acute Treatments

Remember: The acute phase can last 5-7 days

- Antibiotics : NO (unless proven infection)



ACVIM Forum  
Abstract  
Presented at the ACVIM Forum  
June 8, 2017 National Harbor, MD

Evaluation of a Rapid Immunoassay for Point-of-Care Detection of Bacteria in Cat Urine  
Julie Byron

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### Intravesical Application of Lidocaine and Sodium Bicarbonate in the Treatment of Obstructive Idiopathic Lower Urinary Tract Disease in Cats

L. Zezza, C.E. Reusch, and B. Gerber

Intravesical application of lidocaine once a day for 3 days did not change outcome in short and medium term

## Other Treatments

Evaluation of meloxicam for the treatment of obstructive feline idiopathic cystitis

Roswitha Dorsch<sup>1</sup>, Friederike Zellner<sup>1</sup>, Blanka Schutz<sup>1</sup>, Carola Sauter-Louis<sup>2</sup> and Katrin Hartmann<sup>1</sup>

- Meloxicam did not improve re-obstruction rate (+/- 25%), pain, appetite, or outcome when given for 5 days at time of hospitalization (48h indwelling catheter)
  - All cats received buprenorphine
- No statistical significance but trend towards:
  - Less severe clinical signs
  - Shorter duration of clinical signs
  - Less recurrence

A pilot study using synthetic feline facial pheromone for the management of feline idiopathic cystitis  
D.A. Gunn-Moore<sup>1</sup>\*, M.E. Cameron<sup>2</sup>

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## Other Treatments

Intravesical glycosaminoglycans for obstructive feline idiopathic cystitis: a pilot study

Allison M Bradley and Michael R Lappin

- Intravesical GAGs may help (0/7 recurrence in 7 days vs. 3/7 placebo recurrence)
  - Previous study: oral GAG did not help

Efficacy of intravesical pentosan polysulfate sodium in cats with obstructive feline idiopathic cystitis


Mareike Dellile, Laura Fröhlich, Ralf S Müller, Katrin Hartmann and Roswitha Dorsch

- Effective treatment in humans
- 35 cats UO, half placebo and half PPS
  - Urinary catheter clamped after administration at time of placement
  - Repeated after 24h and 48h
- Same reoccurrence rate in 5d for both groups but lower than other studies (17%)

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## FIC Preventative Treatments

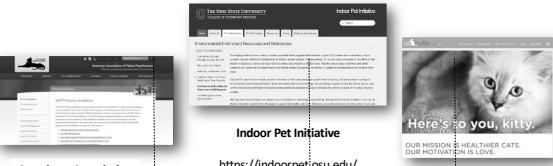
- MEMO: multiple environmental modification
  - Space
  - Scents
  - Interact: play, scratch, climb, hide, rest
  - Food: quiet spot, preference, predatory behaviours
  - Environmental Enrichment
  - Litter box care
  - Decrease number of cats
  - Decrease stress of owners



<https://indoorpet.osu.edu/>

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## FIC Environmental Resources



American Association of Feline Practitioners (AAFP)  
[www.catvets.com](http://www.catvets.com)


Indoor Pet Initiative  
<https://indoorpet.osu.edu/>

Cat Healthy  
[www.cathealthy.ca](http://www.cathealthy.ca)


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## FIC Preventative Treatments

- Water water water**
  - Freshness
  - Refilled, running, fountains, multiple
  - Taste: tap, bottled, flavored




potentially



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## The Diet Debate: It Works!

- Increased water intake by moist food associated with lower FIC recurrence**
  - Buffington et al 1997; Gunn-Moore & Shenoy 2004; Markwell et al 1999, Eisenberg et al 2013
  - Segev et al 2011: dry food higher FIC recurrence
  - Kaul et al 2019: water reduced urolithiasis-associated FLUTD





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## Diet Debate



- Constancy: stay constant**
  - Diet change can result in recurrence of signs
- Consistency: if possible use wet food?**
  - Dry diet: 39% recurrence with a urine specific gravity of 1.050
  - Canned diet: 11% recurrence with a urine specific gravity of <1.030
- Promote weight control/loss** (Lund et al, FJMS 2013)
- Decrease anxiety**
  - Avoid traffic, apps, puzzles, dishes, positive reinforcement

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## The Diet Debate: It Works!

### Comparison of foods with differing nutritional profiles for long-term management of acute nonobstructive idiopathic cystitis in cats

JAVMA, Vol 247, No. 5, September 1, 2015

John M. Kruger, DVM, PhD; Jody P. Lulich, DVM, PhD; Jennifer MacLery, DVM, PhD; Jane Merrills, DVM; Inke Paetkau-Robinson, PhD; John Brejda, PhD; Carl A. Osborne, DVM, PhD

- 31 FIC cats randomized, controlled, masked clinical trial**
  - Urinary management diet vs. control diet, formulation on owner preference
  - Owners documented LUT for 1 y
- Reduction in recurrence of FIC by 8-fold; no difference in formulation**
  - Proportion of cats with FIC lower with test food but not significant
  - Decreased clinical signs and need for analgesia but not in duration of FIC

<https://veterinary-practice.com/article/the-role-of-l-tryptophan-alpha-casozepine>

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## The Diet Debate: It Works!

ORIGINAL ARTICLE

WILEY **nal**  
**te**

### The effect of a therapeutic urinary stress diet on the short-term recurrence of feline idiopathic cystitis


Blanche Naarden | Ronald J. Corbee | *Vet Med Sci.* 2020;6:32-38.

- Urinary management diets: reduce crystalluria, increased omega-3 fatty acids, pH control; and now alpha-casozepine and l-tryptophan**
- 31 FIC cats; 17 fed test food, 14 control food (owner selection) for 5 weeks**
  - Recurrence significantly lower on urinary stress diet (5/17 vs. 11/14)
  - Recurrence odds 8.8X higher on control diet
  - Formulation not significant (wet, dry, combination) but did trend towards decreased recurrence odds on moist or combination

<https://veterinary-practice.com/article/the-role-of-l-tryptophan-alpha-casozepine>

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## Purina Pro Plan Veterinary Supplements: **Hydra Care™**




- Nutrient-enriched water** to improve hydration indices
- Organic osmolytes** derived from whey protein isolates and glycerin
- Intracellular water regulation and also osmoregulation
  - Absorption and retention of water
- Paradigm shift** in helping to balance water intake

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## Meloxicam Does Not Seem To Help (Again)

Received 20 January 2019 | Accepted 1 August 2019  
DOI: 10.1111/jvim.15594

Journal of Veterinary Internal Medicine  American College of Veterinary Internal Medicine

**STANDARD ARTICLE**

**A prospective randomized study of efficacy of 2 treatment protocols in preventing recurrence of clinical signs in 51 male cats with obstructive idiopathic cystitis**


Ran Nivuy | Gilad Segev | Dar Rimer | Yaron Bruchim | Itamar Aroch | Michal Mazzaki-Tovi

**51 cats treated with phenoxybenzamine + alprazolam for 2 weeks then:**

- **Low-dose meloxicam or not for 6 months**
  - 16% OU and 24% FIC 6-month relapse
  - No difference if meloxicam or not

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## Diet and Management Summary




- **Urinary management diets seem to help**
  - Formulation depends on cat
  - Consistency
  - Possible stress reduction
- **Increased water intake likely helpful**
- **Monitoring**
- **MEMO**
- **Other therapy**

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## Recurring FIC... What To Do?

- **Amitriptyline**
  - ONLY for recurrent/chronic cases
  - Tricyclic anti-depressant
  - Eliminated clinical signs with long-term use
    - 73% of cats over six months; 60% of cats over one year of usage
    - Provides some pain relief
  - Short-term use (7 days) not effective, takes 2-3 months to work
  - Side effects
    - Weight gain, somnolence, decreased grooming, cystic calculi



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## What About PU?

**Retrospective study of indications for and outcome of perineal urethrostomy in cats**

M. Bass, J. Howard\*, B. Gerbert and M. Messner  
*Journal of Small Animal Practice* (2005) 46, 227-231

- **Early complications (25%): UTIs, stricture, dehiscence, re-obstruction, sepsis, peritonitis, death**
- **Late complications (28%): UTIs, stricture**
  - 89% of clients thought good quality of life
  - No difference for UO rate in indoor/outdoor cats or diet they ate

**Short- and long-term outcome after perineal urethrostomy in 86 cats with feline lower urinary tract disease**

L. Ryan and R. Heuser  
*Journal of Small Animal Practice* (2012) 53, 933-936

- **86 cats; median survival 3.5y**
- **5.8% did not survive after surgery, another 7% after 6 months**
  - 87% lived beyond 6 months
  - 60% asymptomatic, 40% with FLUTD signs (10% severe)
  - 88% owners say good quality of life

**Welfare of cats 5-29 months after perineal urethrostomy; 74 cases (2015-2017)**

Margaret R Slater, Sharon Paller, Janel M Gayle, Rosevita Cohen\*, Erin L Galloway, Kristen A Frank and Camille DeClement  
*ISVE*

- **Owners identified at least the same QOL vs. prior to sx; 48% said better QOL**
  - Average 7/10 on improved QOL

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## 4. Prognosis

**Guarded long-term prognosis in male cats with urethral obstruction**

Bernhard Gerber DVM, DACVM, DECVBCA\*, Simone Eichenberger DVM, Claudia E Reusch DVM, PhD, DECVBCA  
*Journal of Feline Medicine and Surgery* (2008) 10, 16-23

- **50% had LUTS after discharge**
  - No difference if ate wet food vs. dry food afterwards
  - FIC: 36% re-obstructed (median 17 days)
  - Urethral plugs: 43% re-obstructed; urethrolith group better if had surgery
- **22% PU with 50% recurrence**
  - Euthanasia 21% of cases...

**Initial treatment factors associated with feline urethral obstruction recurrence rate: 192 cases (2004-2010)**

Peter F Henck, DVM, and Elizabeth B. Davidson, DVM, DACVCP  
*JAVMA* 2013

- **Obstructive recurrence rate 24%, did not differentiate causes**
  - 24h reoccurrence rate 10%
  - Prazosin for 7 days helped
  - METACAM and ANTIBIOTICS no difference in UO rate
  - Duration of indwelling catheter no difference after 36-45h
  - 3.5Fr indwelling catheter decreased immediate recurrence

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## Prognosis

- **82 UO vs. 82 non UO cats; cause of UO NOT identified in any of the cases**
  - Outdoor cats had lower risk for development
  - Obesity and dry food increased risk
  - PU in 10% for recurrence or during acute crisis
- **Recurrence of urethral obstruction lower than previous reported (22%)**

**Urethral obstruction in cats: predisposing factors, clinical, clinicopathological characteristics and prognosis**

Gilad Segev DVM, DECVBCA\*, Hofti Livne DVM, Eyal Ranen DVM, Eran Lavy DVM, DCCV  
*Journal of Feline Medicine and Surgery*

**Recurrence rate and long-term course of cats with feline lower urinary tract disease**

Elisabeth Kauf\*, Katrin Hartmann\*, Sven Reese\* and Roswitha Dorisch\*  
*Journal of Small Animal Practice* (2015) 56, 103-108


- **100 cats, from FLUTD to death; 52 FIC, 21 stones, 13 UTI, 15 no dx**
  - Recurrence rate 58% (no difference between groups); more than half had more than 1 relapse over 38 months
  - 14 had different FLUTD cause
  - Mortality 5%
  - Recurrence rate in urolithiasis cats lower if receiving at least 2 PM (water, diet)

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## Prognosis


- **FIC**
  - Recurrence common (30-60%; likely 30-40% ) immediately or in lifetime
  - For males and obstruction: can be serious
    - What helps male cat prognosis: >24h <36h urinary catheter, 3.5Fr catheter, weight loss
- **Stones**
  - Better long-term prognosis
- **UTIs**
  - Depends on why they developed it



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## Back to Stanley




- **CBC/chemistry panel wnl**
- **Urinalysis: struvite crystals, debris, wbc, rbc**
  - Culture negative
- **Bladder ultrasound: significant debris**
- **Abdominal radiographs: no stones**
- **Hospitalization, unblocked**
  - Prazosin, buprenorphine
  - Analysis: plug was mucus/struvite matrix
- **MEMO, urinary management diet**
  - No relapse, debris gone

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## FIC Take Home Points

Acute FIC	Chronic FIC
<ul style="list-style-type: none"> <li>• Diagnostics</li> <li>• Pain control, anxiety</li> <li>• Food support</li> <li>• Fluids</li> <li>• Smaller urinary catheter</li> <li>• Prazosin???</li> </ul>	<ul style="list-style-type: none"> <li>• MEMO</li> <li>• Diet</li> <li>• Monitoring, if recurrence confirm cause</li> <li>• Amitriptyline</li> <li>• PU if MEMO, other therapies not working</li> </ul>



*Just don't try to understand me, ok?*

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### THANKS FOR JOINING!

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