

# Laurel Krause, DVM, DACVIM (SAIM)

- DVM graduate of Colorado State University
- Residency in Small Animal Internal Medicine at Ohio State University
  
- Four cats
- Speaks German
- Former figure skater
- Likes finding cool rocks
- Still hasn't seen The Princess Bride



# Updates on the treatment approach to feline idiopathic cystitis

Laurel Krause, DVM, DACVIM (SAIM)

Oct. 6, 2024

**ASEC** SYMPOSIUM  
2024

A large blue triangle is positioned in the bottom right corner of the slide, pointing towards the top right.

# Learning Objectives:

1. Understand the importance of a multimodal treatment approach for FIC
2. Understand which interventions have the most literature-based support
3. Understand the role of client communication and education as a component of a successful treatment plan

# Disclosures

- Employee of Mars Veterinary Health and VCA Animal Speciality & Emergency Center (ASEC)

# Definitions:

**FLUTD** – feline lower urinary tract disease: any disorder affecting the urinary bladder or urethra of cats (eg, uroliths, urethral plugs, bacterial infection) **regardless of the underlying cause.**

**FIC** – feline idiopathic cystitis: lower urinary tract signs (hematuria, pollakiuria, stranguria, periuria) that often resolve spontaneously within 4 to 7 days with or without treatment. **Other causes have been ruled out.**

---

**FIC is the most common cause of FLUTD, making up 55-67% of cases**

# FIC – Clinical Presentation:

---

Poster child: young adult, male-neutered,  
indoor, obese

- Pollakiuria – many small urinations
- Stranguria – straining to urinate
- Hematuria – blood in the urine
- Periuria – urinating around the house
- Vocalization
- Lower urinary tract obstruction → “blocked cat”

# Diagnostic approach:

<b>Clinical Presentation</b>	<b>Relative Prevalence (%)</b>	<b>Most Common Primary Disease(s) to Exclude</b>	<b>Recommended Diagnostic Tests</b>
Acute self-limiting episodes	80–90	Uroliths	Urinalysis Survey radiographs
Frequently recurring episodes	2–15	Uroliths Behavioral disorders Urinary tract infection	Urinalysis Survey radiographs Behavioral history <sup>a</sup> Quantitative urine culture
Chronic, persistent episodes	2–15	Uroliths Behavioral disorders Urinary tract infection Neoplasia Anatomic defects <sup>b</sup>	Urinalysis Survey radiographs Behavioral history <sup>a</sup> Quantitative urine culture Ultrasonographic examination Contrast cystourethrography

Forrester & Towell, Vet Clin. NA 2015

**A diagnosis of exclusion!**

# Impacts on feline welfare

- 46–61.5% of cats with FIC have repeat episodes
- Inappropriate elimination = risk factor for relinquishment
- Cats with a higher number of recurrences are significantly more likely to be euthanized due to LUT signs compared with cats euthanized due to other causes
- FIC mortality rate: 5–21%
  - Includes cats that died or were euthanized due to LUT obstruction

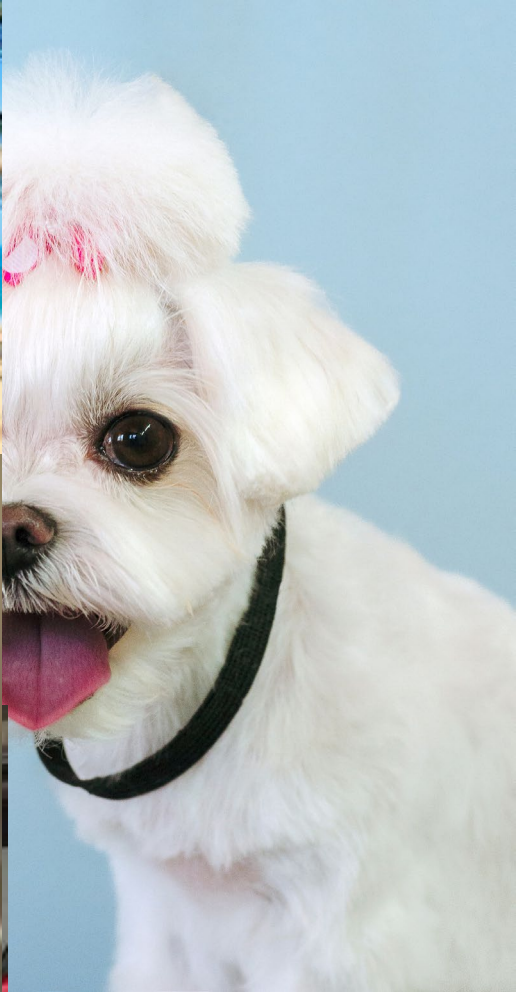
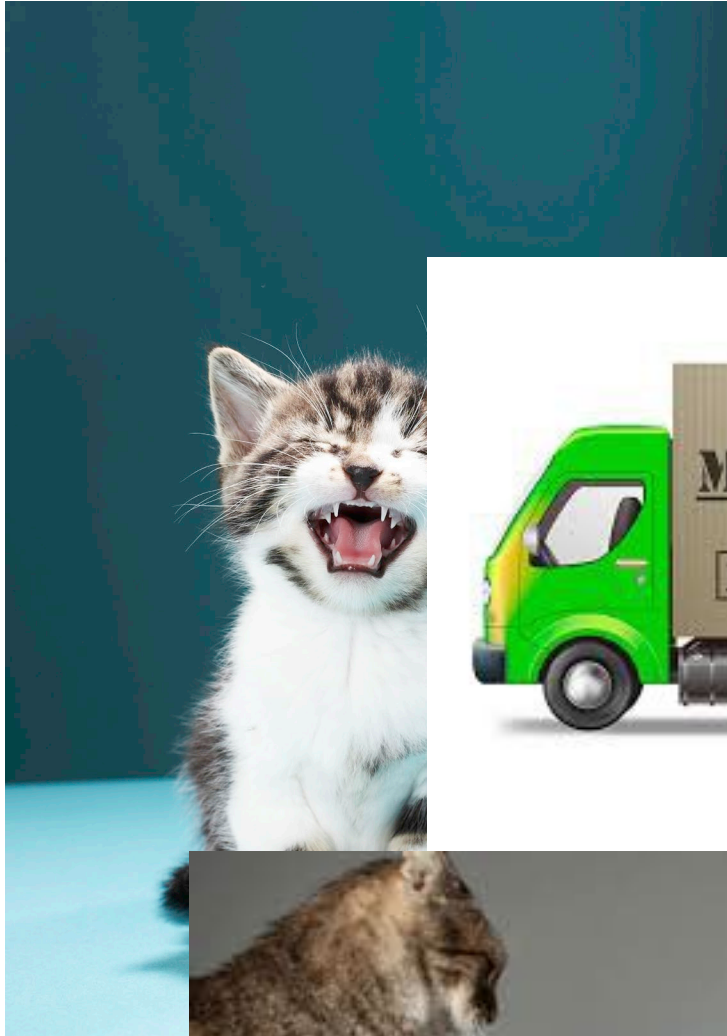


# Etiology and Pathophysiology

"...when susceptible cats are housed in deficient environments, FIC is more likely to occur." - Forrester & Towell, Vet Clin. NA 2015

## Multifactorial & Poorly Understood

- Chronic environmental stress → abnormal neuroendocrine signaling?
- Abnormal bladder mucus layer & wall structure?
  - Similarities to bladder pain syndrome in humans?

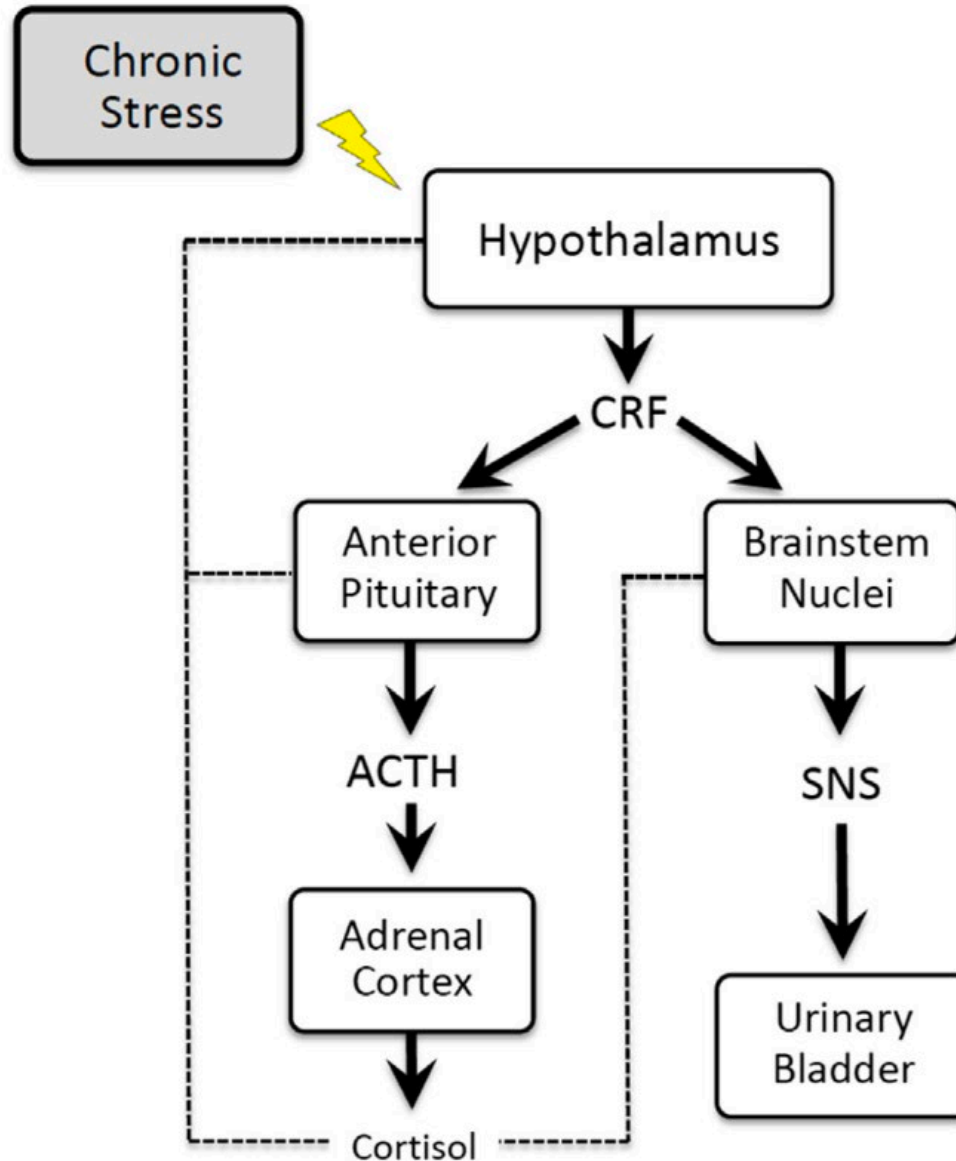


# Etiology

"...when susceptible individuals are exposed to a stressful environment." - Forrester

## Multifactorial

- Chronic environmental stress
- Abnormal neuroendocrine response
  - Similar to PTSD



# Physiology

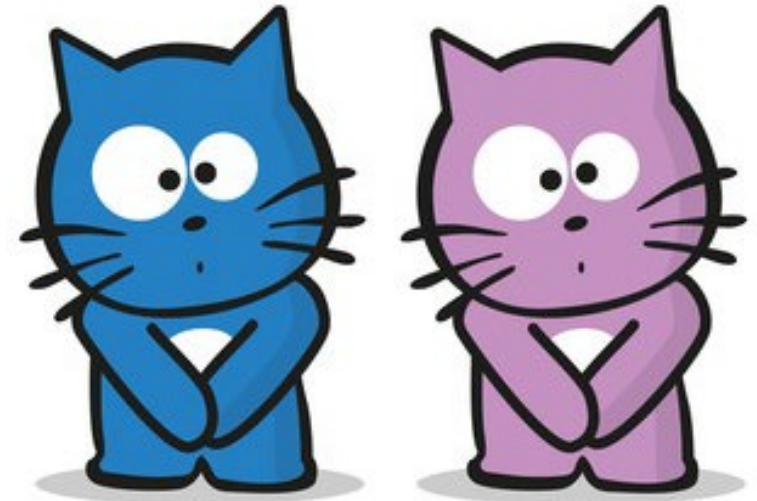
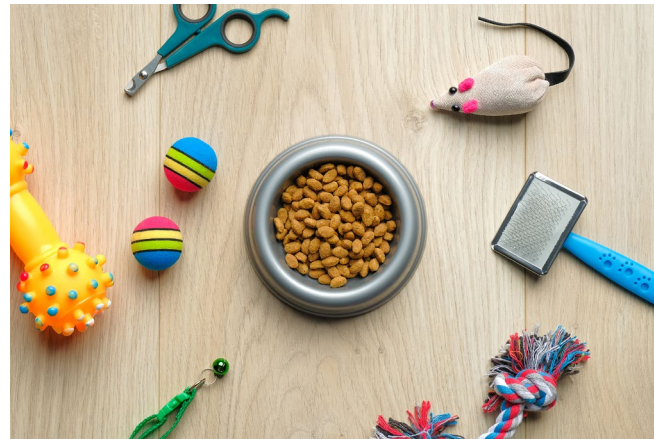
...and in deficient to occur." - 2015

...and abnormal

...wall structure? some in humans?

# You've diagnosed FIC, now what?

Here come the treatment challenges... what even *IS* the treatment?



Does the veterinary community agree on an approach?

# Survey of veterinarians in the USA to evaluate trends in the treatment approach for non-obstructive feline idiopathic cystitis

*Journal of Feline Medicine and Surgery*  
 1–11  
 © The Author(s) 2024  
 Article reuse guidelines:  
[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)  
 DOI: 10.1177/1098612X241260716  
[journals.sagepub.com/home/jfm](https://journals.sagepub.com/home/jfm)  
 This paper was handled and processed  
 by the American Editorial Office (AAFP)  
 for publication in *JFMS*



Laurel R Krause, Emma Li, M Leanne Lilly, Julie Byron ,  
 Edward Cooper and Jessica Quimby 

**Table 1** Summary of proposed treatments or interventions for feline idiopathic cystitis

	Treatment or intervention	Examples
Meds	Analgesics	Buprenorphine, gabapentin, robenacoxib, meloxicam
	Antispasmodic agents	Prazosin, phenoxybenzamine, acepromazine
	Sedatives/anxiolytics	Trazodone, acepromazine, gabapentin, fluoxetine, amitriptyline, alprazolam, lorazepam
	Anti-inflammatories	Robenacoxib, meloxicam, dexamethasone sodium phosphate, prednisolone
Food	Canned diet	Prioritizing feeding any canned diet over dry food
	Prescription diet	Urinary, weight loss, calming, multifunction
Weight control	Weight loss	(If indicated) kilocalorie restriction, increase physical activity
Calming agents	Synthetic feline pheromones	Feline facial pheromone, cat-appeasing pheromone, direct vomeronasal organ receptor agonist
	Calming treatments	Alpha casozepine, L-tryptophan, cannabidiol, melatonin, L-theanine, herbal products (chamomile, hemp, lavender)
Hydration	Hydration support	Subcutaneous fluids, oral hydration supplement, water fountain, adding water to food
Supplements	Nutraceuticals or supplements	Fish oil, glucosamine chondroitin, polysulfated glycosaminoglycan, omega-3 fatty acids
Litter box	Modified litter box management	Improved hygiene, box type or placement, number of boxes, type of litter
	Environmental enhancements	Perches, hiding boxes, alterations in window access
Environmental stimulation	Modified daily human interaction	Interactive play, leash walks, training exercises, petting, grooming (brushing)

# *Survey of veterinarians in the United States to evaluate trends in the treatment approach for nonobstructive feline idiopathic cystitis*

Krause et al., J Feline Med Surg 2024



## Survey focus:

Outpatient treatment approach for cats that are stable, not obstructed and that exhibit lower urinary signs suspected to be due to FIC, where other causes (eg, urolithiasis, urinary tract infection, other) have been ruled out

- **Acute FIC** - cases with acute onset of lower urinary tract signs or acute worsening of chronic signs where a cat is being treated on an outpatient basis
- **Chronic FIC** - cases where an ongoing plan or treatment was recommended to prevent or reduce the recurrence of acute lower urinary tract signs

# Overview of survey outcomes:

606 veterinarians from 48 states + DC submitted complete survey responses

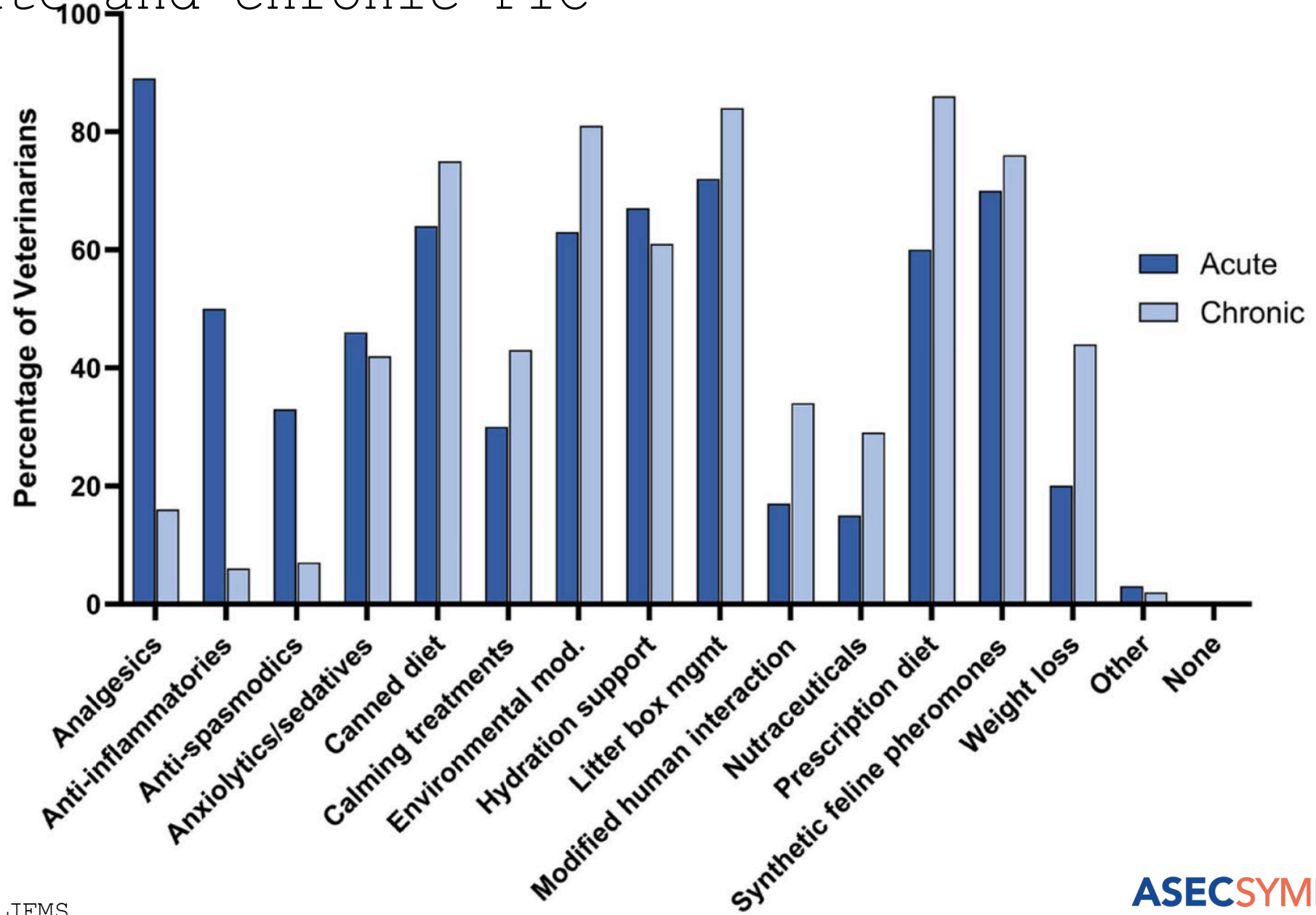
Survey respondents provided information on the following:

- Treatment approaches for acute and chronic FLC
- Client interactions, including history-taking
- Barriers to effective management

Analysis and discussion:

- Compare survey data with literature (where possible)
- Identify areas for improvement or increased focus

# Treatment categories utilized by veterinarians for acute and chronic FIC





# Pharmacologic intervention: analgesics and anxiolytics

**89%** (537/606) of veterinarians surveyed use gabapentin for acute FIC management

**16%** (96/606) management



chronic FIC

**controversial**

**Gabapentin**

Note: there

gabapentin use in

# Pharmacologic intervention: analgesics and anxiolytics

## The gabapentin for analgesia argument:

### Pro

Guedes et al, JAVMA 2018 - owner-perceived improvement in activity of geriatric cats with DJD

### Con

Reid et al, Anesth Analg 2010 - IV gaba did not affect MAC of isofluorane in cats

Pypendop et al, Am J Vet Res 2010 - oral gaba did not impact thermal antinociception in cats

Buprenorphine + gabapentin combination selected by 61% (367/606) of survey respondents for analgesia in acute FIC

### Neutral/Ambiguous

Steagall et al, JFMS 2018 - gaba + bup & gaba + melox combos in cats for OMM, no difference in analgesia, but perhaps depends on pain scale used?

# Pharmacologic intervention: analgesics and anxiolytics

Buprenorphine for analgesia in FIC selected by 76% (460/606) of survey respondents

Buprenorphine route of administration?

Outpatient options → transmucosal (TM), SC (Buprenex vs. Simbadol), transdermal (Zorbium)

- Doodnaught et al, PLoS One 2017 - bup has 24% bioavailability when dosed transmucosally
- Giordano et al, Vet Anaesth Analg 2010 - sig. higher treatment failure (need for rescue analgesia) in cats that received TM bup after OVH compared with cats that received bup via other dosing routes

# Pharmacologic intervention: drugs with more than one effect

---

Consider the intention for prescribing a specific drug

## Examples:

- Gabapentin: analgesia + sedation/anxiolysis
- NSAIDs (e.g. robenacoxib\*, meloxicam\*\*): analgesia + anti-inflammatory

\*Robenacoxib (Onsior): no studies for use in non-obstructive FIC

\*\*Meloxicam (Metacam): no benefit in cases of obstructive FIC (Nelson et al. JFIM 2010; Penedo et al. JFMS

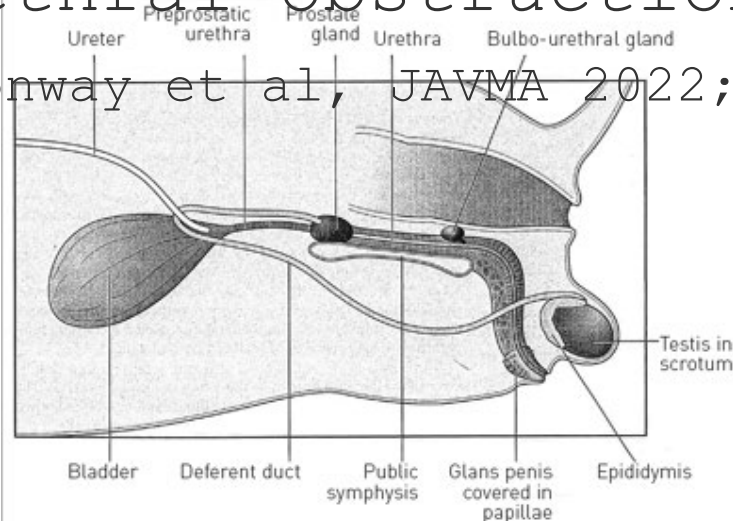
# Pharmacologic intervention: oops, prazosin maybe not

---

Prazosin was the most commonly selected medication in the anti-spasmodic category for acute FIC (286/606, 47%)

Recent studies show that prazosin does not appear beneficial in preventing recurrent urethral obstruction in cats

- Conway et al, JAVMA 2022; Hanson et al, JFMS 2021  
Prazosin MOA: relaxes smooth muscle



Feline male urethra:

Proximal 30% = smooth muscle

Distal 70% = skeletal muscle

# Pharmacologic intervention: lack of support

---

Absence of studies, studies showing no benefit, or studies showing possible contraindication:

Oral glucosamine

Amitriptylline

Prazosin\*

Intravesicular GAGs\*

Meloxicam\*

Acepromazine\* (studies show variable r

Buprenorphine\* (studies show variable

Maropitant\*\* (Cerenia)

\*Studies in obstructive FIC only

\*\*No FIC studies



The Veterinary Journal

Volumes 259–260, May–June 2020, 105471



Evaluating the anti-inflammatory and analgesic properties of maropitant: A systematic review and meta-analysis

R.T. Kinobe <sup>a</sup>  , Y. Miyake <sup>b</sup>  
results)

# Dietary intervention

---

Canned diet ✓

Weight control ✓

## Big picture ideas:

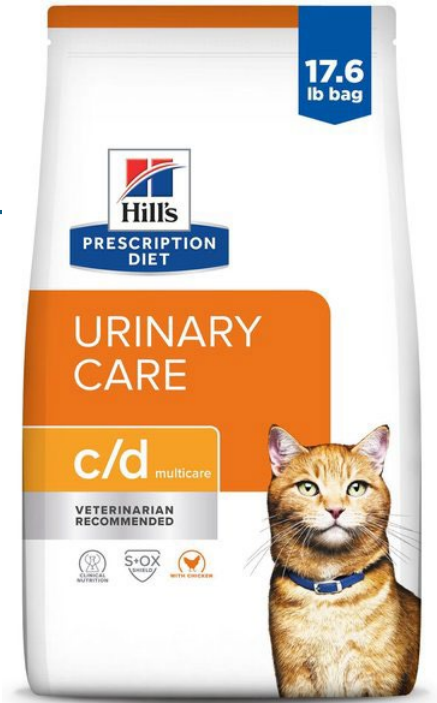
- Canned diet provides extra water intake
  - Commercial or prescription
- Obesity is a risk factor for FIC
  - (Weight loss discussion is beyond the scope of today's presentation)

# Dietary intervention

---

Hill's Prescription Diet c/d Multicare  
Feline Dry - Kruger et al, JAVMA 2015

- Cats fed [study] food had significantly lower mean incidence rates for recurrent episodes of multiple-sign days and episodes of hematuria, dysuria and stranguria as single LUT signs (compared with cats fed control food).
- Significantly fewer cats fed [study] food required analgesics compared with cats fed control food.





# Dietary intervention

---

Hill's Prescription Diet c/d™ Feline Urinary Stress Chicken dry and canned

Naarden and Corbee, Vet Med Sci 2020

- # of cats fed the [study] diet that had an episode of recurrence (5/17) was significantly lower compared with cats that were fed other commercial diets (11/14).
- In the study group, dry vs. canned vs. both did not make a difference



# Multimodal environmental intervention

---



## Clinical evaluation of multimodal environmental modification (MEMO) in the management of cats with idiopathic cystitis

CA Tony Buffington DVM, PhD, DACVN<sup>1,2\*</sup>, Jodi L Westropp DVM, PhD, DACVIM<sup>1,3</sup>,  
Dennis J Chew DVM, DACVIM<sup>1</sup>, Roger R Bolus PhD<sup>2</sup>

**MEMO** is a system of changes to a cat's environment that together result in decreased likelihood of activation of the cat's stress response system, thereby reducing signs of FIC.

# How to MEMO: environmental enhancement

---

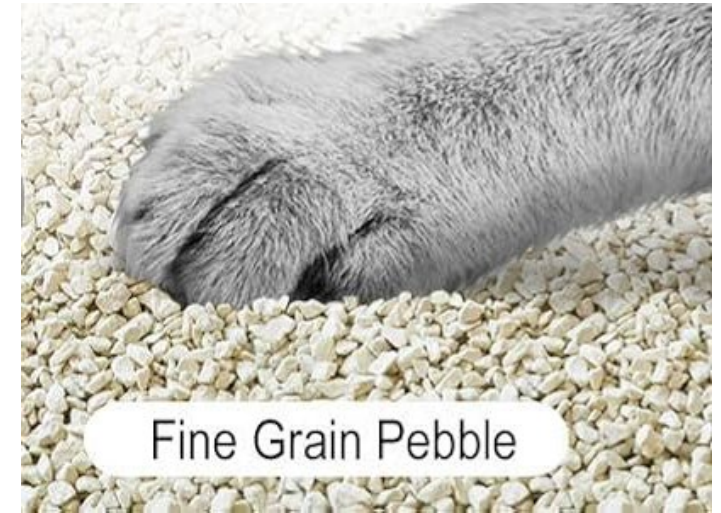


# How to MEMO: litter box management

---

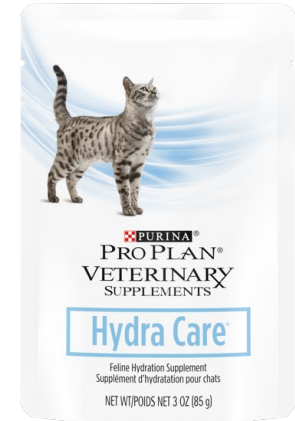


- ✓ Clean
- ✓ Numerous boxes
- ✓ Convenient locations for the cat
- ✓ Separate locations
- ✓ Safe/quiet/protected locations



# How to MEMO: increase water intake

---



# How to MEMO: positive interactions

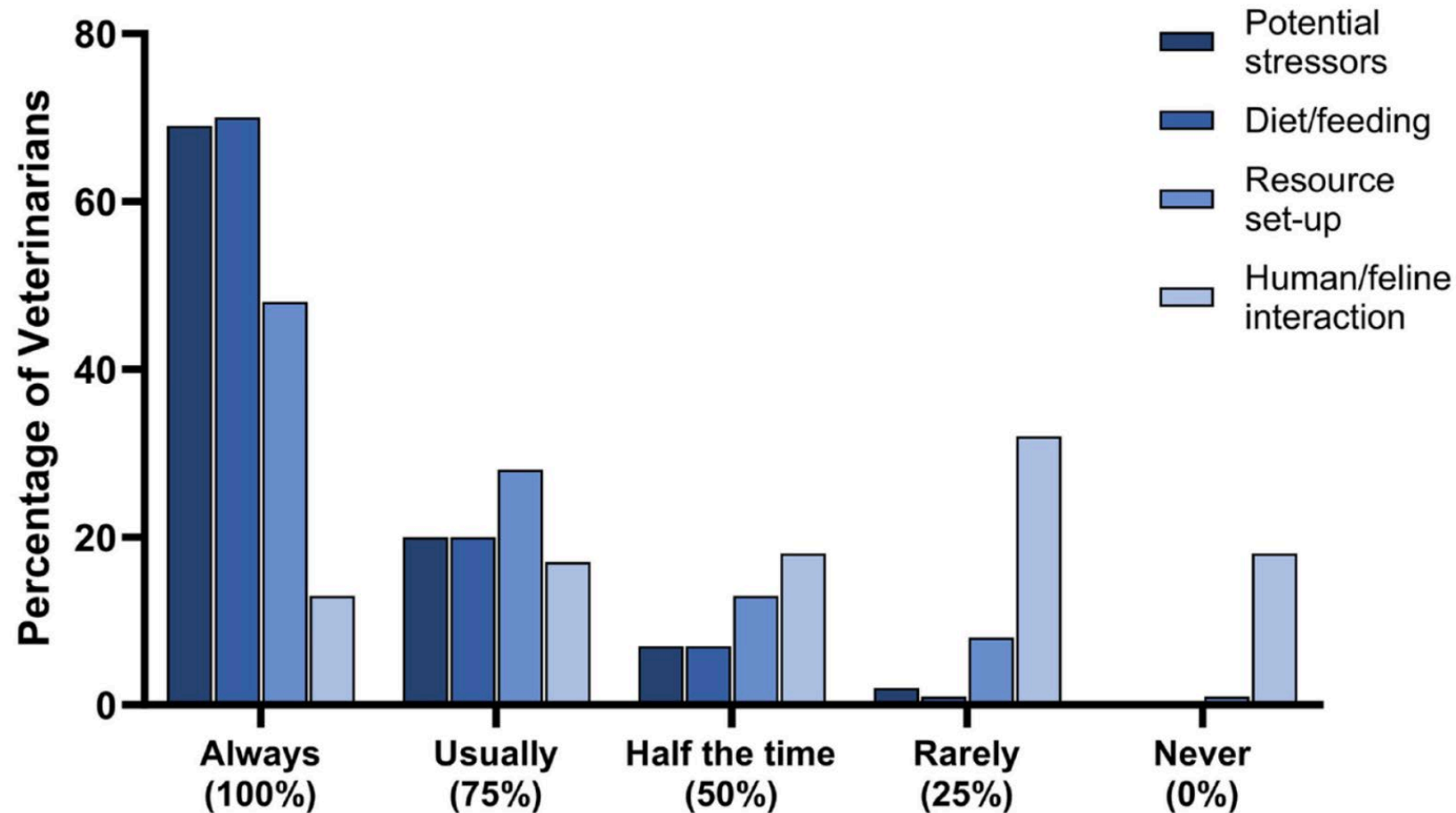
---



# Where do you start?

---

You have to talk to the human (gather history)



# Doing the MEMO

*Journal of Feline Medicine and Surgery* (2013) 15, 219–230

## AAFP and ISEFM Feline Environment

Positive, human-cat interaction is one of the key components of the feline environment.



OF MEMO.



Cats are companion animals that benefit from regular, friendly and predictable social interaction with humans.



table  
s one  
hy  
onent



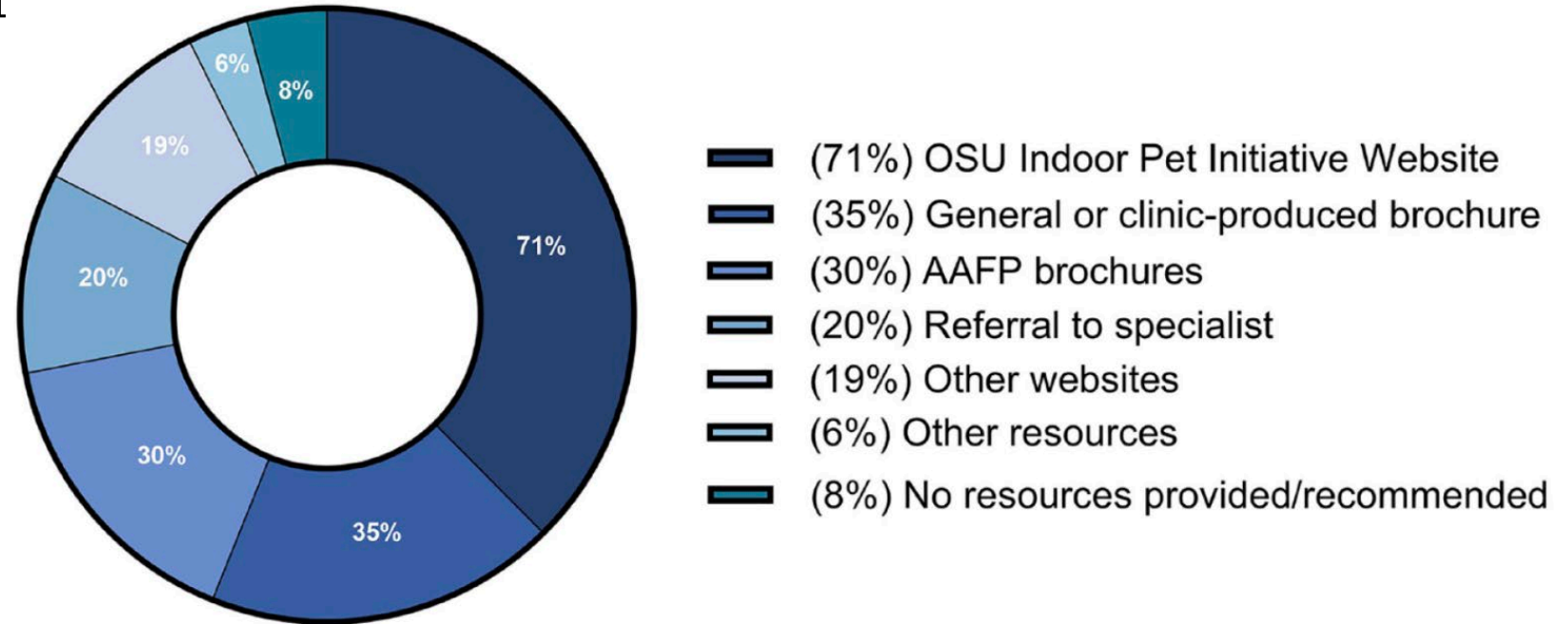
# Doing the MEMO

---

You have to talk to the human again (and use your resources).

Client education is a component of MEMO

Types of educational resources supplied to owners of cats with feline idiopathic cystitis.



Krause et al, JFMS 2024

# Doing the MEMO

---

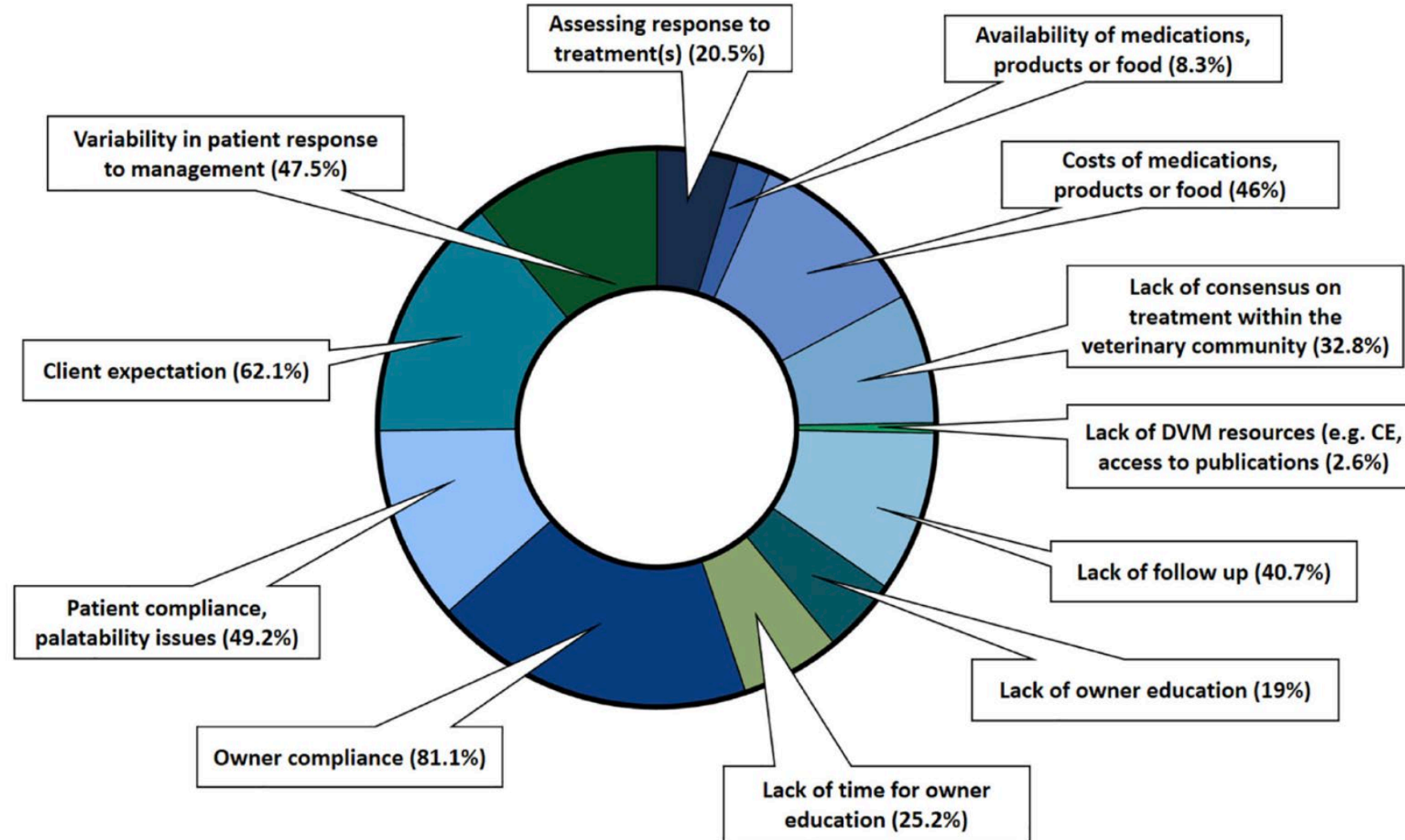
## **You are going to have to make time.**

- Schedule time for client education for FIC consultations just as you would book extra time for any other procedure.

## **You have to set the client's expectations about FIC treatment.**

- Owner compliance (82.1%) and client expectations (61.2%) were the two biggest barriers in achieving a positive treatment outcome. (Krause et al, JFMS 2024)

# Significant barriers to achieving a positive treatment outcome in cases of FIC, as perceived by surveyed veterinarians



# We've done the MEMO

---

- ✓ Spent the time
- ✓ Set expectations
- ✓ Reiterated that FIC is managed, not cured

...But best efforts aren't panning out.

Recommending rehoming is a reasonable option.

(Westropp et al, *Vet Clin North Am Small Anim Pract* 2019)

- Most survey respondents (382/606, 63%) have not recommended rehoming. (Krause et al, *JFMS* 2024)

Hope on the horizon:

## Study's Cystitis Remedy so Effective that NC State Ready to Offer Treatment to Cats

Data is pending on the study's final cat, treated with low-dose radiotherapy last month, but the researchers say every other cat has shown improvement, with most never having another episode of cystitis.

August 29, 2023 | [Burgetta Eplin Wheeler](#) | 4-min. read

"Over the past two years, with some delays because of the COVID pandemic, [Dr.] Kendall, [Dr.] Nolan and their teams have used low-dose radiation to treat 15 male cats

suffering from FIC." **ASEC SYMPOSIUM 2024**

# Takeaways :

- Multimodal/combination approach to FIC treatment
- Use treatments with the most research support:
  - MEMO + diet + hydration + analgesics +/- anxiolytics, etc.
- Client education as part of the treatment plan
  - Schedule extra time for this
  - Set expectations!
- Rehoming is an alternative to euthanasia



# Conclusions

---

Setting a focus on areas for improvement in FIC management will lead to better patient outcomes and client satisfaction.

It is necessary to maintain an ongoing conversation about this condition to promote interest, dialogue, advancement, and build continuity among practitioners.

Multimodal treatment recommendations include client education.



**ASEC**SYMPOSIUM  
2024

Laurel.Krause@vca.com

Thank you  
for  
attending

!ASECSYMPOSIUM  
2024

