

1 **Ins & outs of Feline Elimination Problems**

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SHE/HER

2 **Feline Elimination Problems**

- ▶ Most common cause for relinquishment & return
 - Fractures the human-feline bond
- ▶ Always 'appropriate' from the feline POV
 - Shift in language can help maintain bond
 - *NEVER* spite or dominance

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4 **The History**

- ▶ Clients may report "marking everything"/ "urinating everywhere" "all the time"
 - Very frustrating for clients
- ▶ Critical for differentiating toileting vs marking
- ▶ Who/what/where/when (we'll supply the why)

5 **The history: Who**

- ▶ Video!!
- ▶ Fluorescein not reliable
 - May stain carpet, furniture
 - Fluorescence Δ s w/ pH of urine
 - Original description was for equine concentration
 - ❖ Challenging to obtain
- ▶ Crayon shavings for fecal material...
 - will change microbiome

6 **The History: What**

- ▶ What is being deposited
 - Large amounts of urine? Small amounts?
 - Fecal material?
- ▶ What does the cat look like
 - Before:
 - ❖ Sniffing? Pawing?
 - During:
 - ❖ Tail flag? Standing high?
 - After:
 - ❖ Scratching/covering vs not

7 **The history: Where?**

- ▶ Where is it being deposited?
 - May not be quite where client finds it
 - Room?

- Surface?
- Location relative to
 - ❖ Litter boxes
 - ❖ Socially relevant items including pathways
- ▶ Where is any IN box elimination?
 - ❖
 -

8 **The History: When**

- ▶ When is it found (vs deposited?)
- ▶ How often?
- ▶ What precedes it?
 - Clients may say 'out of the blue' then tell you precisely what precedes a behavior
 - Go back 1-3 days prior as stress is cumulative

9 **IS it... or....**

- 1 Toileting
- 2 Marking
- 3 ▶ Large volume of urine
 - ▶ Horizontal surfaces
 - ▶ May be all box including feces, or some in, some out
 - ▶ Squatting
 - ▶ Covering/digging after
 - ▶ Trigger is IN the household
- 4 ▶ Small volume of urine*
 - ▶ Vertical surfaces*
 - ▶ Socially relevant places
 - Cat decides relevance
 - ▶ Upright posture
 - ▶ Tail flagging
 - ▶ NO scratching/covering/digging
 - ▶

10 **Why- diagnoses**

- ▶ Illness is a stressor
 - rule out & address all reasonable medical illnesses
- ▶ Toileting w/ urine: Rule out causes of pu/pd
 - ❖ Renal dz, hyperthyroidism, hyper-parathyroidism (1° or 2°) rarely Cushing's or Addison's
- ▶ Toileting with defecation: Rule out /address causes of diarrhea
 - May be all historical for only defecating outside the box
- ▶ PAIN
 -

11 **Pain considerations**

- ▶ Can be a stressor
 - Cause of marking
 - Component/contributor to FIC

- ▶ Can impact toileting via
 - Access to litter boxes
 - Position/posture in boxes
 - Increased sensitivity to previously tolerated litter
 - Can create an aversion in as little as 1 episode
 - ❖ Especially for defecation

12 **Toileting: Urine only**

- ▶ CBC/Chem/T4/UA fecal, rads
 - <2% of cats under age 10 have UTIs
 - 20% of cats with urinary signs have stones
- ▶ PE
- ▶ Not PU? No stones?
 - FIC
 - Aversions/preferences
 - Access issues (social or physical)

13 **Toileting: Feces only**

- ▶ CBC/Chem/T4/UA fecal
- ▶ PE
 - Aversions/preferences
 - Access issues (social or physical)

14 **FIC**

- ▶ Bladder, HPA axis, SAM
 - Abnormal catecholamine response
 - Decreased polysulfated glycosaminoglycan barrier
 - ↑ bladder wall mast cells
 - Δ voiding, drinking ↑ concentrated urine contact with bladder wall
 - ❖ Hypersensitization, altered Ca^{2+} response
 - Urine fibronectin ↑

15 **FIC aniopathy**

- ▶ Not all cats with FIC eliminate outside the box
- ▶ May cause box/location/substrate aversions
- ▶ Pandora Syndrome (GI, skin, resp, immune)
 - Other illnesses trigger/compound?
- ▶ More common in obese apartment cats

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17 **Aversion/Preferences**

- ▶ Can create an aversion in 1 event
- ▶ Scary
 - Sounds
 - Dogs
 - Cats
- ▶ Pain!

- ANYWHERE involved (feet, tarsi, stifles, hips, pelvis, abdomen:
 - ❖ Anal gland pain may result in aversion for defecation
 - ❖ FIC pain often results in aversion for u, or all elimination

18 **Common Substrate Preferences**

19 **Common substrate preferences**

20 **Substrate aversion**

- ▶ Not clean enough
 - (may be intermittent)
- ▶ Smell
 - Cleaners?
- ▶ Pain
 - Pointy crystals
 - Not deep enough

21 **Box Aversion**

22 **Location Aversion/Preferences**

23 **Access Issues**

24 **Access Issues**

25 **The Golden Toilet**

- 1 • Large enough to enter, fully circle, stretch to dig (1.5x cat length)
 - Uncovered
 - Unscented clay litter
 - 4-6 inches deep
 - No liner, non automatic
 - Low-lip access point, high sides otherwise
- 2 • Number of cats + 1 boxes in different rooms
 - Box on every floor of the house
 - Quiet, low traffic area
 - On ground level
 -
 - Scooped daily
 - Litter replaced weekly
 - Washed with Dawn soap ~monthly

26 **# Restrooms of # of stalls?**

27

28 **Making more space**

- ▶ Verticality
- ▶ Kitty access to non living areas

29 **Changing gears...Marking**

30 31 **Marking**

- ▶ Goal of leaving a message
- ▶ No scratching after
- ▶ Socially relevant to cat
 - On certain person's clothing
 - Entry-ways
 - Near windows/ doors

32 **Marking**

- ▶ Urine >>>>> feces (middening)
- ▶ Post-pubertal cats
- ▶ Intact Males >> estrual females
 - Neutering resolves marking in 80-90% of males 95% of females
- ▶ Multi-cat households > single cat
 - Incidences ↑ with number of cats

33 **Marking**

- ▶ Any illness can be a stressor
 - PE
 - ❖ measure Anti-Müllerian Hormone (M or F), check for barbs, measure testosterone (m)
 - CBC/Chem/T4/UA, fecal
- ▶ Unless the litter box is a source of stress, litterbox management unlikely to help

34 **Treating Marking**

- ▶ ID stressors and mitigate
- ▶ Cats at territory edge?
- ▶ Loud noises?
- ▶ Social tensions inside the house?

35 **"but they are together all the time"**36 **Treatment Overlap**

- ▶ Aversions & preferences need to be directly addressed +/- additional support
 - Ex: Golden toilet + medications
- ▶ Interventions that decrease stress will improve:
 - FIC
 - Stress/Anxiety related marking
 - Access issues secondary to social stress

37 **Medications**

- ▶ Fluoxetine -0.5-1mg/kg
 - First choice especially for marking:
 - ❖ Decreases marking by 90% in all cats with/in 8 weeks
 - Decreased appetite, lethargy most common side effect
 - WATCH FOR IDIOPATHIC URINE RETENTION

- Transdermal is 10% bioavailable

38 Medications

- ▶ Buspirone 0.5-1mg/kg Q12
 - Increased friendliness common
 - Can see agitation, or aggression
 - Only 55% of cats showed 75% reduction in marking
- ▶ Clomicalm 0.25-2mg/kg Q24
 - 80% of cats improved spraying in multi-cat households
 - Anti-cholinergic- increased risk of obstruction
- ▶ Amitriptyline 0.5-1mg/kg Q24
 - 60% of cats improved with FIC or marking
 - Increased risk of calculi

39 Don't have time to wait?

- ▶ Gabapentin 5-50mg/kg Q8-12
 - Case report for an FIC marking cat for rapid improvement
 - Analgesia, anti-parasthesia(?), anxiolysis
- ▶ Lorazepam 0.025-0.08mg/kg (0.125-0.25 mg/cat Q24)
 - Least hepatically metabolized benzo
 - Case report for cat with FIC & marking

40 Royal Canin Calm™ Diet

41 Hills c/d Diet

- ▶ 25 Multi Cat households (Pereira, 2010)
- ▶ 4 weeks control, 8 weeks with supplementation
- ▶ Decreases:
 - ▶ house soiling, stranguria & dysuria
 - ▶ Shortened FIC episodes

42 Changing the Memo

- ▶ Feliway Classic™
 - Cheek fraction
 - "This area is under control"
- ▶ Spray over urine marks
 - After cleaning
- ▶

43 Feline Pheromones

- ▶ Optimum™
 - direct vomeronasal receptor agonist complex
- ▶ ~60% of cats >70% reduction in signs of stress including urine spraying

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45 References

1. Salman MD, Hutchison J, Ruch-Gallie R, et al. Behavioral Reasons for Relinquishment of Dogs and Cats to 12 Shelters. *Journal of Applied Animal Welfare Science* 2000;3:93–106.

2. Casey RA, Vandenbussche S, Bradshaw JWS, et al. Reasons for Relinquishment and Return of Domestic Cats (*Felis Silvestris Catus*) to Rescue Shelters in the UK. *Anthrozoös* 2009;22:347–358.
3. Herron ME. Advances in Understanding and Treatment of Feline Inappropriate Elimination. *Topics in Companion Animal Medicine* 2010;25:195–202.
4. Sung W, Crowell-Davis SL. Elimination behavior patterns of domestic cats (*Felis catus*) with and without elimination behavior problems. *American Journal of Veterinary Research* 2006;67:1500–1504.
5. Lekcharoensuk C, Osborne CA, Lulich JP. Epidemiologic study of risk factors for lower urinary tract diseases in cats. *Journal of the American Veterinary Medical Association* 2001;218:1429–1435.
6. Tynes VV, Hart BL, Pryor PA, et al. Evaluation of the role of lower urinary tract disease in cats with urine-marking behavior. *J Am Vet Med Assoc* 2003;223:457–461.
7. Evangelista MC, Watanabe R, Leung VSY, et al. Facial expressions of pain in cats: the development and validation of a Feline Grimace Scale. *Sci Rep* 2019;9:19128.
8. Horwitz DF. Behavioral and environmental factors associated with elimination behavior problems in cats: a retrospective study. *Applied Animal Behaviour Science* 1997;52:129–137.
9. Buffington CAT. Idiopathic Cystitis in Domestic Cats—Beyond the Lower Urinary Tract. *J Vet Intern Med* 2011;25:784–796.
10. Westropp JL, Buffington CAT. Feline idiopathic cystitis: current understanding of pathophysiology and management. *Vet Clin North Am Small Anim Pract* 2004;34:1043–1055.
11. Buffington CAT, Westropp JL, Chew DJ, et al. Clinical evaluation of multimodal environmental modification (MEMO) in the management of cats with idiopathic cystitis. *Journal of Feline Medicine and Surgery* 2006;8:261–268.
12. Neilson JC. Housesoiling by cats. In: *BSAVA Manual of Canine and Feline Behavioural Medicine*. 2nd ed. Gloucester, England: British Small Animal Veterinary Association, 2009;117–126.
13. Hart BL, Cooper L. Factors relating to urine spraying and fighting in prepubertally gonadectomized cats. *J Am Vet Med Assoc* 1984;184:1255–1258.
14. Ogata N, Dantas LM de S, Crowell-Davis SL. Selective Serotonin Reuptake Inhibitors. In: *Veterinary psychopharmacology*. Second edition. Hoboken, NJ: Wiley-Blackwell, 2019;103–128.
15. Pryor PA, Hart BL, Cliff KD, et al. Effects of a selective serotonin reuptake inhibitor on urine spraying behavior in cats. *Journal of the American Veterinary Medical Association* 2001;219:1557–1561.
16. Ciribassi J, Luescher A, Pasloske KS, et al. Comparative bioavailability of fluoxetine after transdermal and oral administration to healthy cats. *American Journal of Veterinary Research* 2003;64:994–998.
17. Dantas LM de S, Crowell-Davis, Sharron L. Miscellaneous Serotonergic Agents. In: *Veterinary psychopharmacology*. Second edition. Hoboken, NJ: Wiley-Blackwell, 2019;129–146.
18. Hart BL, Eckstein RA, Powell KL, et al. Effectiveness of buspirone on urine spraying and inappropriate urination in cats. *J Am Vet Med Assoc* 1993;203:254–258.
19. Mealey KL, Peck KE, Bennett BS, et al. Systemic Absorption of Amitriptyline and Buspirone after Oral and Transdermal Administration to Healthy Cats. *Journal of Veterinary Internal Medicine* 2004;18:43–46.
20. Crowell-Davis SL. Tricyclic Antidepressants. In: *Veterinary psychopharmacology*. Second edition. Hoboken, NJ: Wiley-Blackwell, 2019;231–256.
21. Denenberg S ed. *Small animal veterinary psychiatry*. 1st ed. Boston: CAB International; 2020.
22. Hart BL, Cliff KD, Tynes VV, et al. Control of urine marking by use of long-term treatment with fluoxetine or clomipramine in cats. *Journal of the American Veterinary Medical Association* 2005;226:378–382.
23. Landsberg GM, Wilson AL. Effects of clomipramine on cats presented for urine marking. *J Am*

Anim Hosp Assoc 2005;41:3–11.

24. Kruger JM, Conway TS, Kaneene JB, et al. Randomized controlled trial of the efficacy of short-term amitriptyline administration for treatment of acute, nonobstructive, idiopathic lower urinary tract disease in cats. *Journal of the American Veterinary Medical Association* 2003;222:749–758.
25. 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.
26. Lilly ML. Animal Behavior Case of the Month. *Journal of the American Veterinary Medical Association* 2020;257:493–498.
27. Guedes AGP, Meadows JM, Pypendop BH, et al. Assessment of the effects of gabapentin on activity levels and owner-perceived mobility impairment and quality of life in osteoarthritic geriatric cats. *Journal of the American Veterinary Medical Association* 2018;253:579–585.
28. Crowell-Davis SL. Benzodiazepines. In: *Veterinary psychopharmacology*. Second edition. Hoboken, NJ: Wiley-Blackwell, 2019;67–102.
29. Cooper L, Hart BL. Comparison of diazepam with progesterin for effectiveness in suppression of urine spraying behavior in cats. *J Am Vet Med Assoc* 1992;200:797–801.
30. Hughs D, Moreau RE, Overall KL, et al. Acute Hepatic Necrosis And Liver Failure Associated With Benzodiazepine Therapy In Six Cats, 1986–1995. *Journal of Veterinary Emergency and Critical Care* 1996;6:13–20.
31. Center SA, Elston TH, Rowland PH, et al. Fulminant hepatic failure associated with oral administration of diazepam in 11 cats. *J Am Vet Med Assoc* 1996;209:618–625.
32. Hanson KR, Rudloff E, Yuan L, et al. Effect of prazosin on feline recurrent urethral obstruction. *Journal of Feline Medicine and Surgery* 2021;23:1176–1182.
33. Gunn-Moore PDA. FIC (Feline Idiopathic Cystitis) “Leave behind Flier.” 2008. Available at: <http://www.vet.ee/docs/vaikeloom/HIL02591%20FIC%20A4%20Leave%20Behind%20APPROVED.pdf>. Accessed December 17, 2019.
34. Kruger JM, Lulich JP, MacLeay J, et al. Comparison of foods with differing nutritional profiles for long-term management of acute nonobstructive idiopathic cystitis in cats. *Journal of the American Veterinary Medical Association* 2015;247:508–517.
35. Naarden B, Corbee RJ. The effect of a therapeutic urinary stress diet on the short-term recurrence of feline idiopathic cystitis. *Veterinary Medicine and Science* n/a. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/vms3.197>. Accessed December 2, 2019.
36. Landsberg G, Milgram B, Mougeot I, et al. Therapeutic effects of an alpha-casozepine and L-tryptophan supplemented diet on fear and anxiety in the cat. *J Feline Med Surg* 2017;19:594–602.
37. Beata C, Beaumont-Graff E, Coll V, et al. Effect of alpha-casozepine (Zylkene) on anxiety in cats. *Journal of Veterinary Behavior* 2007;2:40–46.
38. Lecouvey M, Frochot C, Miclo L, et al. Two-Dimensional 1H-NMR and CD Structural Analysis in a Micellar Medium of a Bovine α 1-Casein Fragment having Benzodiazepine-Like Properties. *European Journal of Biochemistry* 1997;248:872–878.
39. Gunn-Moore DA, Cameron ME. A pilot study using synthetic feline facial pheromone for the management of feline idiopathic cystitis. *Journal of Feline Medicine and Surgery* 2004;6:133–138.
40. De Jaeger X, Meppiel L, Endersby S, et al. An Initial Open-Label Study of a Novel Pheromone Complex for Use in Cats. *OJVM* 2021;11:105–116.

