

Peer Reviewed



# Lower Urinary Tract Signs in Cats

Chronic recurrent idiopathic lower urinary tract signs (LUTS), commonly diagnosed in feline medicine, are often managed rather than cured.

When a cat presents with LUTS, I provide owners with a better understanding of the disease by comparing management of these signs to that of lactose intolerance; although we cannot replace the gene for lactase, the patient can avoid lactose. This analogy often helps prepare clients to provide appropriate resources and interact with their cat in nonthreatening ways, which can result in significant improvement in LUTS.<sup>1,2</sup> Documenting prevalence and frequency of signs at the start of therapy helps clients see improvement in the cat's condition and sustains motivation to continue therapy. In addition, because this condition has been associated with stress, clients may need to provide additional support during stressful periods (eg, holidays, parties, workers in the home).

Severe recurrent disease may result from early adverse experiences that create a susceptibility that is later unmasked by a provocative environment.<sup>3</sup> Even healthy cats sometimes engage in sickness behaviors, including those associated with LUTS, during stressful periods. According to studies in rodents and humans,<sup>4-6</sup> effective environmental enrichment can mitigate adverse events associated with early life experience, suggesting that the best prevention for unmasking underlying vulnerabilities and expression of

sickness behaviors is creation of appropriately enriched environments.

For cats with chronic recurrent idiopathic LUTS, I divide treatment into acute and chronic cases and consider various factors related to the client, cat, and environment.<sup>7,8</sup> In an appropriately enriched environment, the prognosis is excellent. Success depends less on the cat and more on environmental modification and owner ability to implement necessary changes.

## How I Treat Chronic Recurrent Idiopathic LUTS: Acute Cases

### ❑ Establish client communication

- Express empathy, explain the problem, and clarify misconceptions
- Review history and all body systems
- Implement medication protocol

### ❑ Examine & treat the patient

- Use only feline-friendly handling techniques
- Check for other problems in addition to LUTS
- Initiate analgesic therapy

### ❑ Evaluate environment

- Review resources (placement, availability)
- Develop plan with owner to resolve issues

LUTS = lower urinary tract signs

CONTINUES

### ✓ Establish client communication

- Increase client empathy regarding the cat's pain and lessen client perception of the cat as being "mean"
  - Recurrent LUTS is similar to having a headache in the bladder; both recur unpredictably, are influenced by stress, and respond positively to environmental changes that reduce perception of stress
- Explain the problem and clarify misconceptions
- Review all body systems and environment to support the presence or absence of a systemic disorder (eg, Pandora syndrome)<sup>9</sup> and determine prevalence of sickness behaviors
  - Confirm all relevant information with clients; do not assume clients have supplied all relevant information
- Identify modifiable factors in the cat's environment

### ✓ Examine & treat the patient

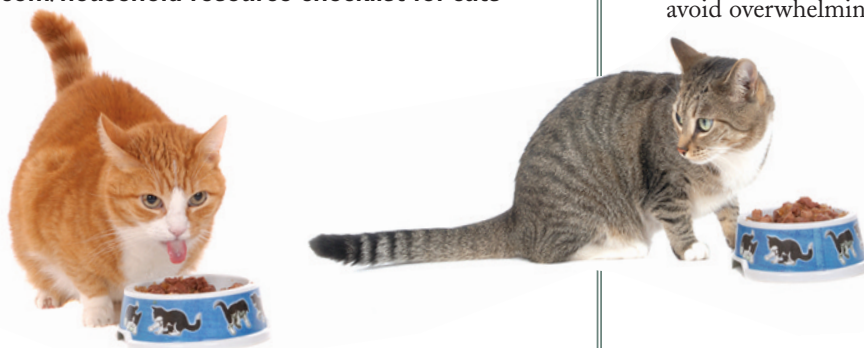
- Use only feline-friendly handling techniques<sup>10</sup>
- Check for other problems in addition to LUTS
  - Cats commonly have signs related to other organ systems (eg, excessive hairballs, lower intestinal tract dysfunction, asthma-like behavior, decreased appetite, behavioral changes [fearful, needy])
- Initiate analgesic therapy<sup>11</sup>
  - I commonly prescribe the injectable form of buprenorphine transmucosally (squirted directly into the mouth)<sup>12,13</sup> at 5–20 µg/kg q6–12h for 5 days after administering a single initial IM injection of 20 µg/kg
  - If tranquilization is necessary, injectable form of acepromazine PO at 2.5 mg/cat q8–12h for 5 days may be considered, with attention to its precautions and contraindications<sup>12</sup>
    - If the cat excessively salivates when given acepromazine, administer one-quarter of a 10-mg tablet in a Greenies Pill Pocket (greenies.com), with canned food, or as a suspension with an oral syringe

## HARMONY AT HOME?

### Ask the client:

- Does each cat have its own food and water bowl?
- Does each cat have a perch to look down on surroundings?
- Do you spend time petting each cat? (If so, for how many minutes?)
- Does each cat have toys that mimic quickly moving prey?

For more questions and a useful handout, see **Household Resource Checklist** by Dr. C. A. Tony Buffington at [cliniciansbrief.com/household-resource-checklist-for-cats](http://cliniciansbrief.com/household-resource-checklist-for-cats)



### ✓ Evaluate environment

- Review environment for stimuli that could threaten the cat's perception of control and predictability:
  - Factors related to other animals or humans, including placement of food, water, and litter box; location of hide, perch, rest, and play areas; environmental noise, odors, and temperature; or disturbance of daily routine
- Work with clients to resolve any identified issues
- Recommend changes after the acute period to avoid overwhelming clients

## How I Treat Chronic Recurrent Idiopathic LUTS: Chronic Cases

### ❑ Establish client communication

- Assign clinician extender
- Implement agreed-on plan
- Follow up with clients to review recommendations, their implementation, and the cat's response

### ❑ Treat the patient

- Readjust diet
- Continue analgesic therapy as needed
- Consider antidepressant drug therapy in refractory cases
- Consider pheromone therapy

### ❑ Evaluate environment

- Confirm appropriate resources and locations
- Develop plans for unexpected events
- Monitor effect of changes on other animals in environment

### ✔ Establish client communication

- Assign clinician extender (eg, technicians, assistant) to help clients identify problem areas, brainstorm solutions, and create specific, workable plans to increase the cat's perception of control and predictability through environmental enrichment
- Implement agreed-on plan
- Follow up within a week to review recommendations
- Follow up at 3 weeks to assist with implementation of changes
  - Determine cat's response to available types and locations of food, litter, and scratching surfaces
  - Troubleshoot inevitable impediments
  - Continue to provide coaching and encouragement for change efforts
- Follow up at 3 months to assess progress, unless additional contact is needed in the interim
- Consider referral to a behavior specialist if no progress is made or the clinician's or patient's relationship with the client becomes strained

### ✔ Treat the patient

#### Readjust Diet

- Note that no nutrient or ingredient has been demonstrated as effective treatment
  - What, where, and how the cat is fed may influence its perception of control and predictability, lessening its expression of LUTS and other signs

- Ask client about the cat's feeding preferences and encourage client to offer dietary options in individual containers at mealtime; discuss the cat's responses with client
  - Feeding from food puzzles provides activity and mental stimulation
- Consider introducing Greenies Pill Pockets as a treat to prepare the cat for potential drug therapy

#### Implement Medication

- If environmental modification is insufficient for resolving clinical signs, another course of buprenorphine, possibly at a higher dose, may be tried
- If the cat tolerates administration of oral medications, consider an antidepressant such as amitriptyline or clomipramine at 5–12.5 mg/cat PO q24h, always using the lowest possible dose<sup>13,14</sup>
  - Should be given for ≥3 months, after which the dose can be tapered gradually and stopped if possible
  - Avoid using these drugs in cats with heart disease; perform a CBC and serum biochemistry profile to monitor platelet/WBC counts and liver enzyme activities before and at 1, 3, and 6 months of therapy
- Consider pheromone therapy (Feliway, feliway.com) if patient fails to improve in an enriched environment

CONTINUES

#### FIND MORE...

To discover more on sickness behaviors, visit [cliniciansbrief.com/sickness-behaviors-fic](http://cliniciansbrief.com/sickness-behaviors-fic)

- Note that various drugs and remedies not recommended here have proven ineffective in clinical trials; signs usually resolve within days without drug therapy, and many cats seem to perceive oral medication as threatening<sup>6,7</sup>
- Forcing oral medications may add a level of threat that exacerbates the problem, frustrating the client and weakening the animal-human bond

## ☑ Evaluate environment

- Evaluate influences of a multicat household
  - Resource conflict with other cats is often an overlooked source of threat
  - Monitor the effect of changes on other animals in the environment
  - Although owners may have separate food bowls for each cat, placing food, water, and litter boxes out of sight of another cat's resources often improves outcome



See Aids & Resources, back page, for references & suggested reading.

## ! Take-Home Points

- To sustain motivation to continue therapy, help clients recognize improvement in their cat's condition.
- Don't assume clients have supplied all relevant information.
- Review environment for stimuli that could threaten the cat's perception of control and predictability.
- Encourage clients to offer dietary variety.
- When administering antidepressants to cats, always use the lowest possible dose; avoid using antidepressants in cats with heart disease.
- Success depends less on the cat and more on environmental modification and owner ability to implement necessary changes.
- Consider referral to a behavior specialist if no progress is made.

## FIND MORE...

For more extensive information about environmental enrichment, visit [cliniciansbrief.com/what-cat-owners-can-learn-about-captivity](http://cliniciansbrief.com/what-cat-owners-can-learn-about-captivity)

**revolution**<sup>®</sup>  
(selamectin)

## Topical Parasiticide for Dogs and Cats

### BRIEF SUMMARY:

See package insert for full prescribing information.

### CAUTION:

US Federal law restricts this drug to use by or on the order of a licensed veterinarian.

### INDICATIONS:

Revolution is recommended for use in dogs six weeks of age or older and cats eight weeks of age and older for the following parasites and indications:

#### Dogs:

Revolution kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (*Ctenocephalides felis*), prevention of heartworm disease caused by *Dirofilaria immitis*, and the treatment and control of ear mite (*Otodectes cynotis*) infestations. Revolution also is indicated for the treatment and control of sarcoptic mange (*Sarcoptes scabiei*) and for the control of tick infestations due to *Dermacentor variabilis*.

#### Cats:

Revolution kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (*Ctenocephalides felis*), prevention of heartworm disease caused by *Dirofilaria immitis*, and the treatment and control of ear mite (*Otodectes cynotis*) infestations. Revolution is also indicated for the treatment and control of roundworm (*Toxocara cati*) and intestinal hookworm (*Ancylostoma tubaeforme*) infections in cats.

### WARNINGS:

#### Not for human use. Keep out of the reach of children.

In humans, Revolution may be irritating to skin and eyes. Reactions such as hives, itching and skin redness have been reported in humans in rare instances. Individuals with known hypersensitivity to Revolution should use the product with caution or consult a health care professional. Revolution contains isopropyl alcohol and the preservative butylated hydroxytoluene (BHT). Wash hands after use and wash off any product in contact with the skin immediately with soap and water. If contact with eyes occurs, then flush eyes copiously with water. In case of ingestion by a human, contact a physician immediately. The material safety data sheet (MSDS) provides more detailed occupational safety information. For a copy of the MSDS or to report adverse reactions attributable to exposure to this product, call 1-800-366-5288.

Flammable—Keep away from heat, sparks, open flames or other sources of ignition.

Do not use in sick, debilitated or underweight animals. (see SAFETY)

### PRECAUTIONS:

Prior to administration of Revolution, dogs should be tested for existing heartworm infections. At the discretion of the veterinarian, infected dogs should be treated to remove adult heartworms. Revolution is not effective against adult *D. immitis* and, while the number of circulating microfilariae may decrease following treatment, Revolution is not effective for microfilariae clearance.

Hypersensitivity reactions have not been observed in dogs with patent heartworm infections administered three times the recommended dose of Revolution. Higher doses were not tested.

### ADVERSE REACTIONS:

#### Pre-approval clinical trials:

Following treatment with Revolution, transient localized alopecia with or without inflammation at or near the site of application was observed in approximately 1% of 691 treated cats. Other signs observed rarely (<0.5% of 1743 treated cats and dogs) included vomiting, loose stool or diarrhea with or without blood, anorexia, lethargy, salivation, tachypnea, and muscle tremors.

#### Post-approval experience:

In addition to the aforementioned clinical signs that were reported in pre-approval clinical trials, there have been reports of pruritus, urticaria, erythema, ataxia, fever and rare reports of death. There have also been rare reports of seizures in dogs. (see WARNINGS)

### SAFETY:

Revolution has been tested safe in over 100 different pure and mixed breeds of healthy dogs and over 15 different pure and mixed breeds of healthy cats, including pregnant and lactating females, breeding males and females, puppies six weeks of age and older, kittens eight weeks of age and older, and avermectin-sensitive collies. A kitten, estimated to be 5–6 weeks old (0.3 kg), died 8 1/2 hours after receiving a single treatment of Revolution at the recommended dosage. The kitten displayed clinical signs which included muscle spasms, salivation and neurological signs. The kitten was a stray with an unknown history and was malnourished and underweight (see WARNINGS).

DOGS: In safety studies, Revolution was administered at 1, 3, 5, and 10 times the recommended dose to six-week-old puppies, and no adverse reactions were observed. The safety of Revolution administered orally also was tested in case of accidental oral ingestion. Oral administration of Revolution at the recommended topical dose in 5- to 8-month-old beagles did not cause any adverse reactions. In a pre-clinical study selamectin was dosed orally to ivermectin-sensitive collies. Oral administration of 2.5, 10, and 15 mg/kg in this dose escalating study did not cause any adverse reactions; however, eight hours after receiving 5 mg/kg orally, one avermectin-sensitive collie became ataxic for several hours, but did not show any other adverse reactions after receiving subsequent doses of 10 and 15 mg/kg orally. In a topical safety study conducted with avermectin-sensitive collies at 1, 3 and 5 times the recommended dose of Revolution, salivation was observed in all treatment groups, including the vehicle control. Revolution also was administered at 3 times the recommended dose to heartworm infected dogs, and no adverse effects were observed.

CATS: In safety studies, Revolution was applied at 1, 3, 5, and 10 times the recommended dose to six-week-old kittens. No adverse reactions were observed. The safety of Revolution administered orally also was tested in case of accidental oral ingestion. Oral administration of the recommended topical dose of Revolution to cats caused salivation and intermittent vomiting. Revolution also was applied at 4 times the recommended dose to patent heartworm infected cats, and no adverse reactions were observed.

In well-controlled clinical studies, Revolution was used safely in animals receiving other frequently used veterinary products such as vaccines, anthelmintics, antiparasitics, antibiotics, steroids, collars, shampoos and dips.

**STORAGE CONDITIONS:** Store below 30°C (86°F).

**HOW SUPPLIED:** Available in eight separate dose strengths for dogs and cats of different weights. Revolution for puppies and kittens is available in cartons containing 3 single dose tubes. Revolution for cats and dogs is available in cartons containing 3 or 6 single dose tubes.

NADA 141-152, Approved by FDA.

REVOLUTION is a registered trademark of Pfizer Inc. ©2012 Pfizer Inc. All rights reserved.

**Pfizer Animal Health**

Distributed by:  
Pfizer Animal Health  
Division of Pfizer Inc.  
New York, NY 10017

[www.revolutionpet.com](http://www.revolutionpet.com)

10309503  
April 2012