

GET MOVING The mainstay of feline idiopathic constipation management is nutrition, including potential modifications to diet form and fiber intake.



NUTRITION NOTES

Nutrition and Feline Idiopathic Constipation

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Constipation is characterized by prolonged gastrointestinal (GI) transit, associated with dry stool and difficult or absent defecation.¹ Although cats of all ages and both sexes can be affected, middle-aged to older male cats are over-represented.²⁻⁵ Constipation can occur secondary to local GI or systemic diseases (**TABLE 1**). After predisposing causes are excluded, the diagnosis for an estimated 60% to 70% of cats is idiopathic constipation.¹⁶ Cats with recurrent constipation require lifelong therapy; some with refractory disease need periodic hospitalization or surgical intervention. This article describes the diagnosis and medical management of feline idiopathic constipation, with a focus on nutritional strategies.

ETIOLOGY

The pathophysiology of feline idiopathic constipation is incompletely understood but is most likely multifactorial; contributing factors include dehydration, GI neuronal signaling, and GI-microbiome interactions. An *in vitro* study showed that the colonic contractile response to neurotransmitters (e.g., acetylcholine, cholecystokinin, substance P) is less in cats with end-stage disease (i.e., megacolon) than in healthy cats.¹⁷ Studying cats with megacolon limits the ability to interpret whether dysmotility is the

underlying cause of disease or secondary to chronic distention. The same study found that decreased contractility was not related to decreased colonic muscle mass and that smooth muscle histopathology was normal.¹⁷

A recent study found that, in cats with constipation of varying severity, GI pacemaker cells (i.e., interstitial cells of Cajal) were decreased, numbers of myenteric neurons were decreased, and myenteric neurons were degenerate.⁴ Together, those findings suggest disordered enteric nervous system stimulation rather than a primary muscular disorder, which enables selection of therapies that could improve response to enteric nervous system signaling.

Additional evidence supports a self-perpetuating process, wherein retained feces become progressively dehydrated as a result of normal colonic water absorption.¹⁸ Recurrent constipation contributes to permanent distention and dysmotility.^{2,10,19}

DIAGNOSIS

History

For cats presented with constipation, a thorough



history is critical. History enables assessment of disease severity and identification of environmental and diet factors that can be targeted therapeutically. Key questions include duration of signs, frequency of constipation episodes, time of last defecation, and stool volume during defecation. Fecal scoring²⁰ can be used to define stool consistency at presentation and to gauge therapeutic response. **BOX 1** lists clinical signs reported in cats with constipation as well as less common signs related to GI mucosal irritation or marked tenesmus (e.g., vomiting). Key environmental questions include litterbox accessibility and hygiene, difficulty getting into the litterbox, and water sources (e.g., types and accessibility). Diet history should include diet form (i.e., dry versus canned), amount fed, feeding frequency, specific diet (including protein and carbohydrate sources), recent diet changes, and any treats or supplements.

BOX 1 Clinical Signs of Idiopathic Constipation in Cats^{2,5,7,15,18,21}

Commonly Observed

- Abdominal pain
- Decreased to absent defecation
- Hyporexia
- Lethargy
- Small, dry feces
- Tenesmus

Less Commonly Observed

- Hematochezia
- Intermittent diarrhea
- Vocalization during defecation
- Vomiting

Examination

Abdominal palpation of constipated cats reliably detects a colon distended with firm feces. Other findings can include dehydration, abdominal pain, and weight loss associated with either decreased food intake or predisposing chronic disease.^{2,21} Complete

orthopedic and neurologic examinations are indicated to evaluate for pain, focal neurologic deficits, or generalized autonomic dysfunction. Digital rectal examination rules out rectal stricture and secondary perineal hernia but for most cats requires sedation or general anesthesia.

TABLE 1 Underlying Causes of Constipation in Cats

CATEGORY	EXAMPLES
Drugs (selected) ⁶	<ul style="list-style-type: none"> ■ Opioids ■ Aluminum hydroxide ■ Cholinergic antagonists (e.g., atropine) ■ Sucralfate
Electrolyte abnormalities ^{1,2,7}	<ul style="list-style-type: none"> ■ Hypercalcemia ■ Hypokalemia
Endocrine disease unrelated to primary polyuria ^{5,8}	<ul style="list-style-type: none"> ■ Congenital hypothyroidism ■ Iatrogenic hypothyroidism
Orthopedic or local obstructive disease ^{1,5,7,9,10}	<ul style="list-style-type: none"> ■ Compressive extracolonic pelvic canal masses ■ Healed pelvic fractures ■ Intraluminal colonic masses ■ Osteoarthritis ■ Rectal stricture
Primary gastrointestinal (GI) disease ²	<ul style="list-style-type: none"> ■ Inflammatory bowel disease ■ Small cell GI lymphoma
Primary polyuria with inadequate water intake ^{2,9}	<ul style="list-style-type: none"> ■ Chronic kidney disease ■ Diabetes mellitus
Primary neurologic disease ^{5,11-14}	<ul style="list-style-type: none"> ■ Aganglionosis/hypoganglionosis ■ Breed-related sacral spinal cord deformity (Manx cats) ■ Dysautonomia ■ Lumbosacral disease
Miscellaneous ^{2,5,12,15}	<ul style="list-style-type: none"> ■ Behavioral (i.e., litterbox avoidance, lack of exercise) ■ Congenital megacolon ■ Dehydration or water restriction ■ Obesity

Diagnostic Tests

All cats with constipation should undergo abdominal radiography to determine severity and rule out predisposing anatomic factors. Radiographic constipation is defined as a maximum colonic diameter >1.3 times the length of the fifth lumbar vertebral body.²² Ratios of >1.48 have been associated with radiographic megacolon and >1.62 with medical management failure (i.e., need for subtotal colectomy).²² Note, however, that a single radiograph can diagnose only existing constipation, not clinical obstipation or megacolon. Clinical obstipation implies a loss of functional reserve, and diagnosis is based on lack of treatment response. Megacolon is a descriptive term for end-stage disease associated with permanent dilation and motility loss.^{7,16} Treatment recommendations should be based on serial clinical observations.

Although a minimum database (complete blood count, serum chemistry profile, urinalysis) does not establish the diagnosis of constipation, one can be used to identify predisposing metabolic causes and objectively assess hydration status. When hypothyroidism is suspected, total thyroxine and thyroid-stimulating hormone concentrations should be measured.

THERAPEUTIC APPROACHES

Immediate treatment of severe constipation is aimed at resolving dehydration and promoting evacuation of fecal material. Strategies include combinations of intravenous fluids, enteral (nasogastric) water or osmotic electrolyte solutions, lactulose, enemas, and manual deobstipation.^{1,7,22} Before performing manual deobstipation, dehydration should be corrected and attempts should be made to aid fecal passage via enteral or enema-administered osmotic agents; most cats administered the aforementioned treatment will defecate without the need for manual deobstipation.^{2,23} After the acute episode has been corrected, the next focus should be preventing recurrence, and the mainstay of management is nutrition.

DIETARY INTERVENTION/ MANAGEMENT

Diet Form

Regardless of diet form, cats with recurrent constipation should have free-choice, unobstructed access to fresh water, and strategies should be used to

increase water intake.²⁴ Historically, canned food has been recommended. However, a recent study found no difference in diet form between cats presented to an emergency room for constipation versus other diseases,² but that study did not control for other diet factors (e.g., macronutrient content, specifically fiber) or factors affecting hydration. Because many cats requiring in-hospital management of constipation are dehydrated and treatments for chronic feline constipation increase needed water intake, the author still recommends a canned diet. In cats unwilling to eat a canned diet, water can be added to kibble, which increases dietary water content and subsequently fecal water content.²⁵ It can also be helpful to try foods of different textures (e.g., paté versus morsels with gravy).

Fiber Content

The most common macronutrient manipulated in cats with idiopathic constipation is fiber. Broad recommendations tend to focus on high-fiber versus low-fiber diets; however, this approach is oversimplified. Different fibers play distinctive roles in constipation management. Unfortunately, few prospective studies have evaluated fiber type in cats with chronic constipation; therefore, most historical recommendations are based on expert opinion, in vivo studies in healthy cats, or extrapolated from in vitro effects on fecal material or intestinal mucosa of healthy cats or dogs. The different types of diets for cats with chronic constipation are those with low-solubility/insoluble nonfermentable fibers, moderate-to-high solubility fibers with varying fermentability, and low residue/low fiber.

- **Low-solubility to insoluble nonfermentable fibers** (e.g., cellulose, wheat bran) act as bulking agents. Insoluble fiber promotes motility by direct colonic distention and may benefit cats with constipation but without clinical obstipation/megacolon. In cats with loss of colonic function, diets high in insoluble fiber may worsen clinical signs by increasing fecal content in those with ineffective peristalsis. Diets high in insoluble fiber also decrease fecal moisture;²⁶ therefore, it is crucial that cats fed these diets consume adequate water.
- **Moderate-to-high solubility fibers** help retain water within the colon but may still increase bulk, depending on not only solubility but also fermentability. Fermentability describes the extent of fiber metabolism by GI bacteria to by-products, such as short-chain fatty acids (SCFAs).

Psyllium is a soluble, nonfermentable fiber that



forms a mucilaginous gel within the colon and is a common fiber source in commercial foods. Although fiber sources in this category increase fecal bulk and should be used cautiously in cats with severely decreased motility, they also promote colonic water retention, which helps mitigate absorptive water loss. One study showed that a psyllium-containing diet improved chronic constipation in cats, completely resolving clinical signs for 82% to 93%.²¹ However, the observed effect cannot be attributed to psyllium alone because the diet fed in that study contained other fiber sources (chicory pulp) and additives (fructooligosaccharides, mannan-oligosaccharides), which have been shown to affect fecal SCFAs.

In vitro studies using soluble, fermentable fibers (e.g., many pectins, gums, inulin) have demonstrated increased fecal SCFAs²⁷⁻²⁹ and support the role of SCFAs in promoting colonic motility in cats.³⁰ Highly fermentable fibers also increase fecal water content via osmotic pull.^{28,31}

Many commercial foods contain a mixture of insoluble and soluble, fermentable fibers (e.g., beet pulp). Findings of several in vitro studies suggest that a moderately soluble and fermentable fiber profile may result in the best fecal environment (e.g., pH, water content, SCFA profile).^{27-29,32,33} A mixed-fiber profile increases fecal volume and water content. A study of cats with constipation but not clinical megacolon found that a mixed-fiber diet improved signs in all cats within 1 month.³⁴

■ **Low-residue diets** are low in fiber and contain highly digestible proteins, fats, and carbohydrates (>87% to 90%), leading to decreased fecal bulk. These diets may benefit cats with severely decreased colonic motility; however, prospective studies of low-residue diets in cats with clinical obstruction/megacolon are lacking.

In addition to being included in a commercial diet, fiber can be supplemented independently. For example, unflavored psyllium powder can be added to a low-residue diet at a recommended dose of 1 to 4 teaspoons twice daily.⁷ To the author's knowledge, no studies have compared fiber-supplemented versus low-residue diets in cats with chronic constipation; multiple diet trials may be needed.

Supplements and Ancillary Medications

Treatment for feline idiopathic constipation is often multimodal, including many drugs and supplements (TABLE 2) in addition to dietary management. These supplements often target either improved (i.e., less firm) stool consistency or increased colonic contractility. For many cats, an osmotic laxative combined with a promotility medication with actions on colonic contractility can be effective. In vivo evidence supports efficacy of osmotic laxatives in cats with constipation.^{35,36} Promotility drugs appear safe³⁸ and have in vivo efficacy for other GI motility disorders

TABLE 2 Supplements and Medications with Evidence for Use in Cats with Idiopathic Constipation

PRODUCT TYPE	POPULATION STUDIED	EFFECTS
OSMOTIC LAXATIVES		
Polyethylene glycol 3350	<ul style="list-style-type: none"> Healthy cats (in vivo) Cats hospitalized for constipation Expert opinion 	<ul style="list-style-type: none"> Soft, formed stools³⁵ Improved stool consistency and defecation within 24 hours³⁶ Soft-formed stools at doses starting at 0.5 mL/kg and titrating to effect⁷
Lactulose		
PREBIOTICS		
FOS, GOS	<ul style="list-style-type: none"> Healthy cats (in vitro) Healthy cats (in vivo) 	<ul style="list-style-type: none"> Increased fecal SCFAs²⁹ Increased fecal water content (fecal score), SCFAs^{28,32,33}
PROBIOTICS		
SLAB51	<ul style="list-style-type: none"> Cats with chronic constipation, including a subset with radiographic megacolon (in vivo) 	<ul style="list-style-type: none"> 70% normalization of fecal scores; increased colonic interstitial cells of Cajal⁴
PROMOTILITY DRUGS		
Cisapride	<ul style="list-style-type: none"> Healthy cats (in vitro) Cats with idiopathic megacolon that failed medical management (in vitro) 	<ul style="list-style-type: none"> Colonic contractile response similar to substance P¹⁷ Colonic contractile response similar to acetylcholine but still decreased versus healthy cats³⁷

FOS=fructooligosaccharides; GOS=galactooligosaccharides; SCFAs=short-chain fatty acids.

Osurnia®

(florfenicol, terbinafine, betamethasone acetate)

Otic gel

For Otic Use in Dogs Only

Do not use in cats

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

BRIEF SUMMARY (for full prescribing information, see package insert)

DESCRIPTION: OSURNIA contains 10 mg florfenicol, 10 mg terbinafine and 1 mg betamethasone acetate per mL and the inactive ingredients propylene carbonate, glycerol formal, hypromellose, phospholipid, oleic acid and BHT in an off-white to slightly yellow translucent gel.

INDICATION: OSURNIA is indicated for the treatment of otitis externa in dogs associated with susceptible strains of bacteria (*Staphylococcus pseudintermedius*) and yeast (*Malassezia pachydermatis*).

DOSAGE AND ADMINISTRATION: OSURNIA should be administered in the clinic. Clean and dry the external ear canal before administering the initial dose of the product. Administer one dose (1 tube) per affected ear(s) and repeat administration in 7 days. Do not clean the ear canal for 45 days after the initial administration to allow contact of the gel with the ear canal. Cleaning the ear may affect product effectiveness (see **Effectiveness** in the product insert). If alternative otic therapies are required it is recommended to clean the ear(s) before application. Open tube by twisting the soft tip. Insert the flexible tip into the affected external ear canal(s) and squeeze entire tube contents into the external ear canal(s). After application, gently massage the base of the ear to allow the gel to penetrate to the lower part of the ear canal.

CONTRAINDICATIONS: Do not use in dogs with known tympanic perforation (see **Precautions** in the product insert). Do not use in dogs with a hypersensitivity to florfenicol, terbinafine, or corticosteroids.

WARNINGS:

Human Safety Warning:

OSURNIA may cause eye injury and irritation

Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. In case of accidental skin contact, wash area thoroughly with water.

Avoid contact to the eyes. In case of accidental eye contact, flush thoroughly with water for at least 15 minutes. If symptoms develop, seek medical advice.

PRECAUTIONS: Wear eye protection when administering OSURNIA and restrain the dog to minimize post-application head shaking. Reducing the potential for splatter of product will help prevent accidental eye exposure in people and dogs and help to prevent ocular injury. Do not administer orally. The use of OSURNIA in dogs with perforated tympanic membranes has not been evaluated. The integrity of the tympanic membrane should be confirmed before administering this product. Reevaluate the dog if hearing loss or signs of vestibular dysfunction are observed during treatment. Use of topical oint corticosteroids has been associated with adrenocortical suppression and iatrogenic hyperadrenocorticism in dogs (see **Animal Safety** in the product insert). Use with caution in dogs with impaired hepatic function (see **Animal Safety and Adverse Reactions** in the product insert). The safe use of OSURNIA in dogs used for breeding purposes, during pregnancy, or in lactating bitches, has not been evaluated.

ADVERSE REACTIONS: The following adverse reactions were reported during the course of a US field study for treatment of otitis externa in dogs treated with OSURNIA in decreasing order: elevated liver enzymes, vomiting, weight loss (>10% body weight) and hearing loss. To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Dechra Veterinary Products at (866) 933-2472. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

POST-APPROVAL EXPERIENCE (2020): The following adverse events are based on post-approval adverse drug experience reporting for OSURNIA. Not all adverse events are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using this data.

In humans, accidental exposure leading to corneal ulcers and other ocular injuries such as eye irritation, burning, stinging, and itchiness have been reported to occur when the dog shook its head after application of OSURNIA.

In dogs, the adverse events reported for OSURNIA are presented below in decreasing order of reporting frequency: Deafness, ear discharge, ear irritation and pain, vomiting, head shaking, head tilt, ataxia, vocalization, corneal ulcer, keratoconjunctivitis sicca, nystagmus, tympanic rupture, and facial paralysis.

INFORMATION FOR DOG OWNERS: Owners should be aware that adverse reactions may occur following administration of OSURNIA and should observe dog for signs such as deafness, ear pain and irritation, vomiting, head shaking, head tilt, incoordination, eye pain and ocular discharge (see **Animal Safety and Post-Approval Experience** in the product insert). Owners should be advised to contact their veterinarian if any of the above signs are observed.

Owners should also be informed that splatter may occur if the dog shakes its head following administration of OSURNIA which may lead to ocular exposure. As a result, eye injuries in humans and dogs have been reported including corneal ulcers.

EFFECTIVENESS: Effectiveness was evaluated in 235 dogs with otitis externa. The study was a double-masked field study with a placebo control (vehicle without the active ingredients). One hundred and fifty-nine dogs were treated with OSURNIA and seventy-six dogs were treated with the placebo control. All dogs were evaluated for safety. Treatment (1 mL) was administered to the affected ear(s) and repeated 7 days later. Prior to the first administration, the ear(s) were cleaned with saline but not prior to the Day 7 administration. Six clinical signs associated with otitis externa were evaluated: pain, erythema, exudate, swelling, odor and ulceration. Total clinical scores were assigned for a dog based on the severity of each clinical sign on Days 0, 7, 14, 30 and 45. Success was determined by clinical improvement at Day 45. The success rates of the two groups were significantly different (p=0.0094); 64.78% of dogs administered OSURNIA were successfully treated, compared to 43.42% of the dogs in the placebo control group.

STORAGE CONDITIONS: OSURNIA should be stored under refrigerated conditions between 36° - 46° F (2° - 8° C). To facilitate comfort during administration, OSURNIA may be brought to room temperature and stored for up to three months.

MANUFACTURED FOR:

Dechra Veterinary Products
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R 03 2021



in cats³⁹ as well as in vitro evidence for stimulation of colonic motility.^{17,37} These medications are typically added when rehydration and diet modification alone are not sufficient to control clinical signs. However, maintaining hydration is still critical when ancillary medications, particularly laxatives, are added. Although more studies are needed, newer therapies targeting the GI microbiome to achieve improved fecal consistency in healthy cats (e.g., prebiotics^{28,29,32,33}) and cats with chronic constipation (e.g., probiotics⁴) are promising. Because the effects of various prebiotics and probiotics are not interchangeable, evidence for use cannot be extrapolated to other bacterial strains or products.

TAKE-HOME POINTS

- Dietary management is key to long-term therapy in cats with chronic idiopathic constipation.
- Fiber is the most promising macronutrient for improving chronic idiopathic constipation. Individual cats may benefit from different combinations of soluble versus insoluble and fermentable versus nonfermentable fibers.
- Distinguishing between radiographic versus clinical obstipation/megacolon may affect choice of the most beneficial diet for an individual cat.
- Because fiber supplementation and ancillary medications (e.g., osmotic laxatives) can increase water needs, adequate water intake should be ensured.
- Treatment of chronic feline constipation requires an individualized approach, with periodic monitoring and adjustment of diet strategies and ancillary therapies, depending on the cat's response. **TVP**

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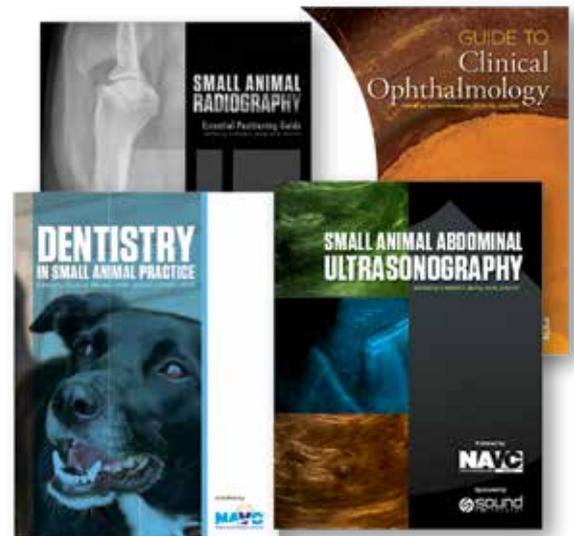


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