

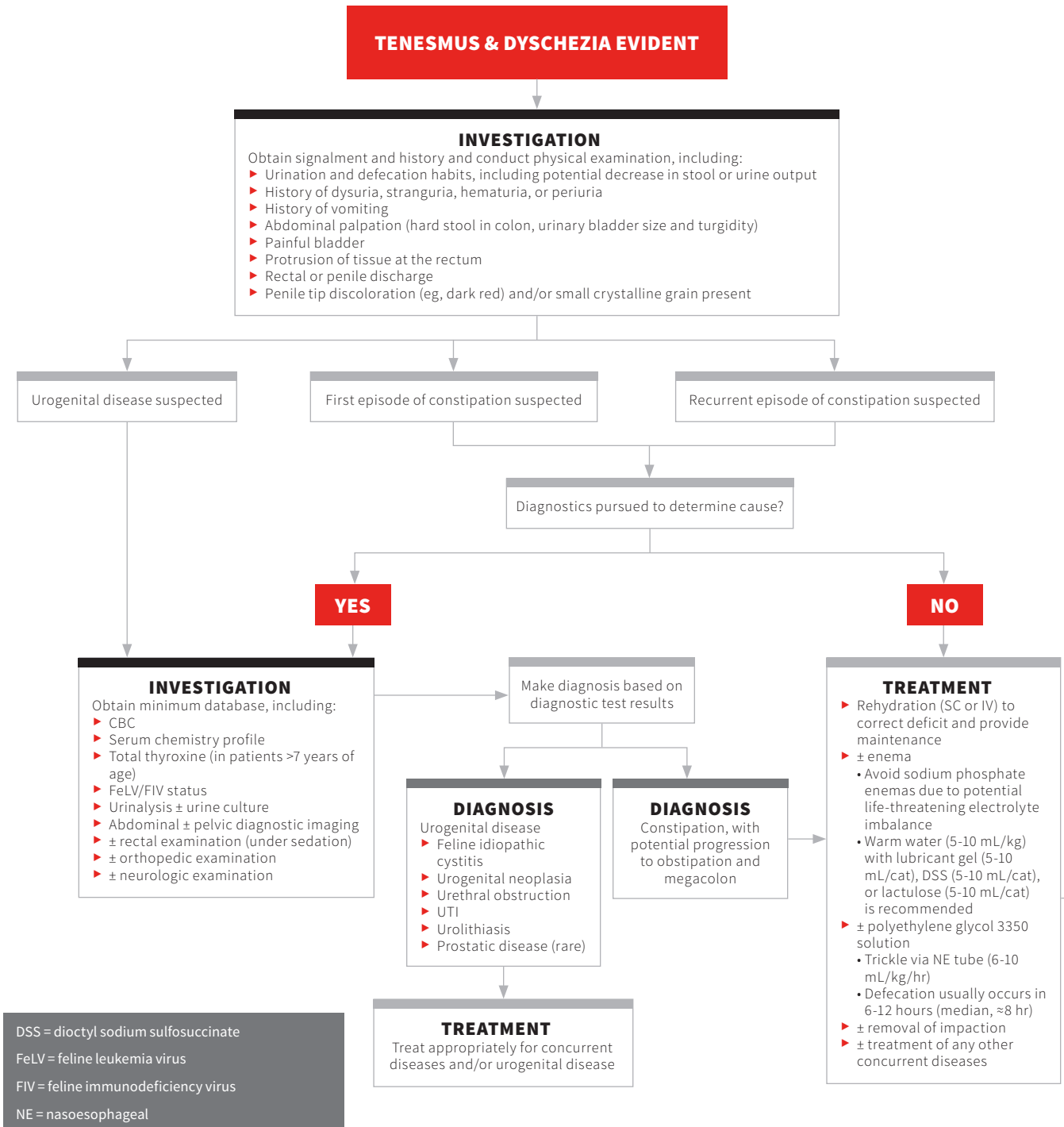
# DIAGNOSING CONSTIPATION, OBSTIPATION, & MEGACOLON IN CATS

Glenn A. Olah, DVM, PhD, DABVP (Feline)

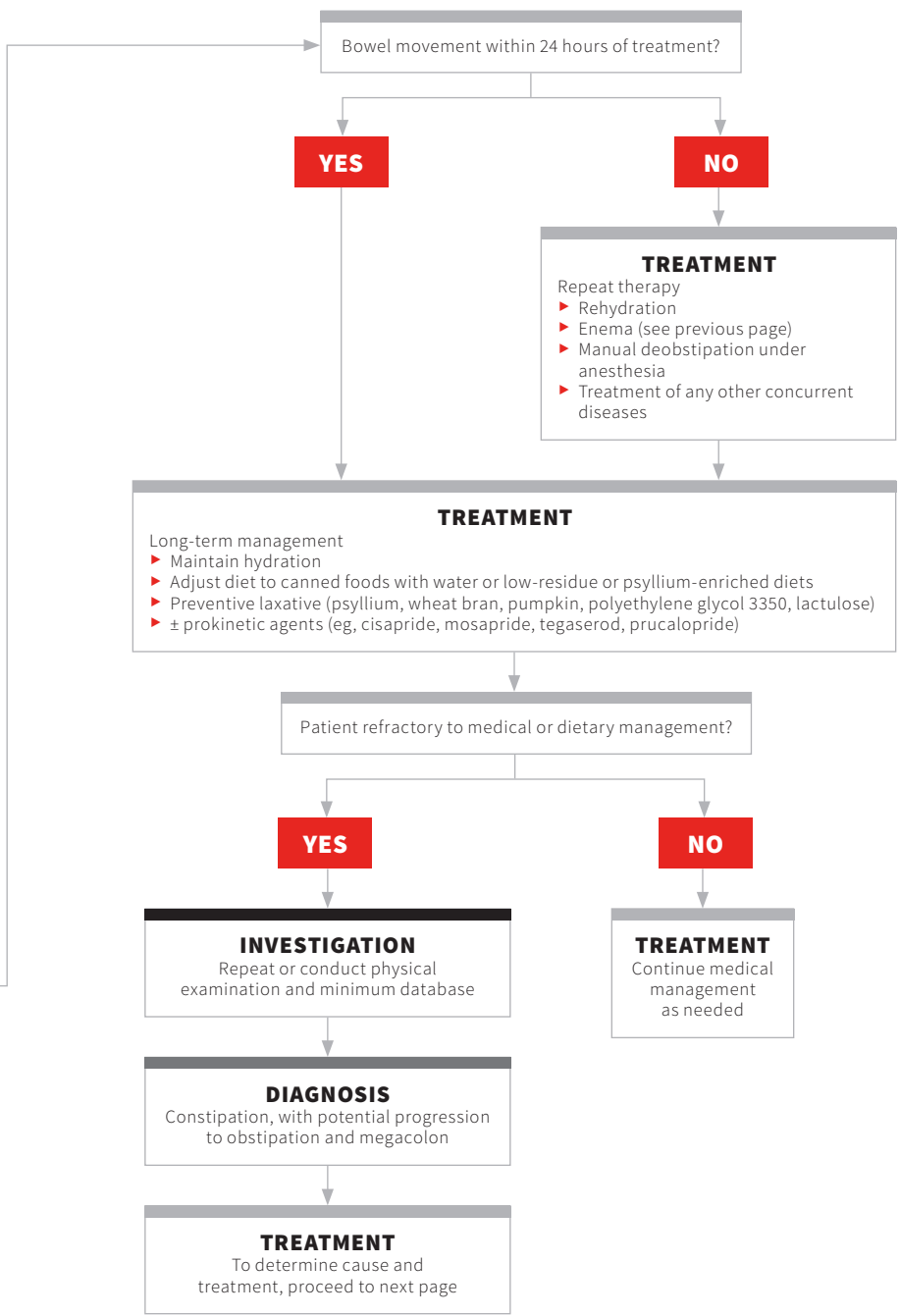
Winn Feline Foundation

Albuquerque Cat Clinic

Albuquerque, New Mexico



DSS = dioctyl sodium sulfosuccinate  
 FeLV = feline leukemia virus  
 FIV = feline immunodeficiency virus  
 NE = nasoesophageal





**DIAGNOSIS**  
Constipation, with potential progression to obstipation and megacolon\*

Determine etiology based on previously performed diagnostic test results

- ETIOLOGY**  
Behavioral/environmental factors
- ▶ Environmental change (eg, new home, new routine, seasonality)
  - ▶ Inactivity
  - ▶ Intercat conflict
  - ▶ Soiled litter box
  - ▶ Stress and/or anxiety (eg, hospitalization)

- TREATMENT**
- ▶ Address environmental needs (see **Suggested Reading**, page 71)
  - ▶ Address intercat social structure
  - ▶ Address litter box issues
  - ▶ Provide stress and/or anxiety management

- ETIOLOGY**  
Neuromuscular dysfunction
- ▶ Spinal disease
    - Intervertebral disk disease
    - Lumbosacral stenosis/cauda equina syndrome
    - Sacrocaudal dysgenesis (eg, in Manx cats)
    - Infection (eg, FIP, FeLV/FIV) or fungal disease
    - Neoplasia
  - ▶ Hypogastric or pelvic nerve disease
    - Neoplasia
    - Trauma injury
  - ▶ Submucosal or myenteric plexus neuropathy
    - Aging
    - Dysautonomia
    - Infection (eg, FIP, FeLV/FIV) or fungal disease
    - Neoplasia
  - ▶ Colonic smooth muscle dysfunction (ie, megacolon)

- TREATMENT**
- ▶ Treat or manage underlying cause
  - ▶ Further diagnostics may be required

- ETIOLOGY**  
Inflammation/infection
- ▶ Perianal bite wounds and/or abscess
  - ▶ Anal sacculitis and/or abscess
  - ▶ Arthritis
  - ▶ Proctitis
  - ▶ Perineal fistula and/or rectal diverticulum

- TREATMENT**
- ▶ Abscess treatment
  - ▶ Antibiotics
  - ▶ Foreign body removal
  - ▶ Anti-inflammatory drugs (eg, NSAIDs, tacrolimus, cyclosporine, corticosteroids)
  - ▶ Anal gland expression and/or removal

\*Megacolon is suggestive of neuromuscular dysfunction.

CKD = chronic kidney disease  
DM = diabetes mellitus  
FeLV = feline leukemia virus  
FIP = feline infectious peritonitis  
FIV = feline immunodeficiency virus  
IBD = inflammatory bowel disease

**ETIOLOGY**  
 Adverse drug effects  
 ▶ Opiates  
 ▶ Anticholinergics  
 ▶ Diuretics  
 ▶ Antianxiety or psychotropic drugs  
 ▶ Phenothiazines  
 ▶ Barium sulfate

**TREATMENT**  
 ▶ Discontinue medication  
 ▶ Change medication

**DIAGNOSIS**  
 Recurrent constipation or obstipation, with or without reversibly dilated colon for <6 months

**TREATMENT**  
 Return to **First/Recurrent Episode Constipation Treatment** box, page 18

**ETIOLOGY**  
 Metabolic/endocrine  
 ▶ Metabolic  
 • Obesity  
 • Dehydration (due to CKD, hyperthyroidism, or DM)  
 • Hypercalcemia (due to CKD or idiopathic hypercalcemia)  
 ▶ Endocrine  
 • Hypothyroidism (iatrogenic or acquired)  
 • Nutritional or renal secondary hyperparathyroidism

**TREATMENT**  
 Treat underlying cause (eg, CKD, hyperthyroidism, DM, idiopathic hypercalcemia)

**DIAGNOSIS**  
 Long-standing obstipation or megacolon

**TREATMENT**  
 Perform subtotal colectomy if patient has obstipation for >6 months or if dilated colon (ie, megacolon) present for >6 months

**ETIOLOGY**  
 Mechanical obstruction  
 ▶ Intraluminal  
 • Colonic foreign body  
 • Anorectal foreign body or fecolith  
 • Rectal diverticulum  
 • Perineal hernia  
 • Anorectal stricture/stenosis  
 ▶ Intramural  
 • Neoplasia  
 • IBD  
 ▶ Extraluminal  
 • Pelvic fractures and/or malunions, with secondary obstipation or megacolon  
 • Pseudocoprostasis (eg, in longhair cats)  
 • Neoplasia

**TREATMENT**  
 ▶ Treat or manage underlying cause  
 ▶ For pelvic fractures and/or malunions, perform surgical pelvic canal widening if obstipation or megacolon is present for <6 months or subtotal colectomy if obstipation or megacolon present for >6 months

See next page for references.

## References

- Atkins CE, Tyler R, Greenlee P. Clinical, biochemical, acid-base, and electrolyte abnormalities in cats after hypertonic sodium phosphate enema administration. *Am J Vet Res.* 1985;46(4):980-988.
- Baral RM. Constipation and megacolon. In: Little SE, ed. *The Cat: Clinical Medicine and Management.* St. Louis, MO: Elsevier Saunders; 2012: 484-490.
- Bertoy RW. Megacolon in the cat. *Vet Clin North Am Small Anim Pract.* 2002;32(4):901-915.
- Byers CG, Leasure C, Sanders N. Feline idiopathic megacolon. *Compend Contin Educ Vet.* 2006;28(9):658-665.
- Carr AP, Gaunt MC. Constipation resolution with administration of polyethylene glycol solution in cats (abstract). *J Vet Intern Med.* 2010;24:753-754.
- Chandler M. Focus on nutrition: dietary management of gastrointestinal disease. *Compend Contin Educ Vet.* 2013;35(6):E1-E3.
- Elliott JW, Blackwood L. Treatment and outcome of four cats with apocrine gland carcinoma of the anal sac and review of the literature. *J Feline Med Surg.* 2011;13(10):712-717.
- Foley P. Constipation, tenesmus, dyschezia, and fecal incontinence. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine.* 8th ed. St. Louis, MO: Elsevier; 2017:171-174.
- Freiche V, Houston D, Weese H, et al. Uncontrolled study assessing the impact of a psyllium-enriched extruded dry diet on fecal consistency in cats with constipation. *J Feline Med Surg.* 2011;13(12):903-911.
- Gaschen F. Disorders of esophageal, gastric, and intestinal motility in cats. In: Little SE, ed. *August's Consultations in Feline Internal Medicine,* vol. 7. St. Louis, MO: Elsevier; 2016:117-128.
- German AC, Cunliffe NA, Morgan KL. Faecal consistency and risk factors for diarrhoea and constipation in cats in UK rehoming shelters. *J Feline Med Surg.* 2017;19(1):57-65.
- Gregory CR, Guilford WG, Berry CR, Olsen J, Pederson NC. Enteric function in cats after subtotal colectomy for treatment of megacolon. *Vet Surg.* 1990;19(3):216-220.
- Hall EJ. Disease of the large intestine. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine.* 8th ed. St. Louis, MO: Elsevier; 2017:1565-1592.
- Hall JA, Washabau RJ. Diagnosis and treatment of gastric motility disorders. *Vet Clin North Am Small Anim Pract.* 1999;29(2):377-395.
- Hasler AH, Washabau RJ. Cisapride stimulates contraction of idiopathic megacolon smooth muscle in cats. *J Vet Intern Med.* 1997;11(6):313-318.
- Little S. How I treat ... constipation in cats. Paper presented at: Southern European Veterinary 2016 Conference; October 20-22, 2016; Grenada, Spain.
- Meeson RL, Geddes AT. Management and long-term outcome of pelvic fractures: a retrospective study of 43 cats. *J Feline Med Surg.* 2017;19(1):36-41.
- Rondeau MP, Meltzer K, Michel KE, McManus CM, Washabau RJ. Short chain fatty acids stimulate feline colonic smooth muscle contraction. *J Feline Med Surg.* 2003;5(3):167-173.
- Rosin E, Walshaw R, Mehlhaff C, Matthiesen D, Orsher R, Kusba J. Subtotal colectomy for treatment of chronic constipation associated with idiopathic megacolon in cats: 38 cases (1979-1985). *J Am Vet Med Assoc.* 1988;193(7):850-853.
- Scherk M. All bunged up: unclogging the constipation cat. *DVM360.* DVM360 website. <http://veterinarymedicine.dvm360.com/all-bunged-unclogging-constipated-cat>. Published March 11, 2015. Accessed July 30, 2018.
- Tam FM, Carr AP, Myers SL. Safety and palatability of polyethylene glycol 3350 as an oral laxative in cats. *J Feline Med Surg.* 2011;13(10):694-697.
- Tomsa K, Steffen F, Glaus T. Life-threatening metabolic disorders after application of a sodium phosphate containing enema in the dog and cat. *Schweiz Arch Tierheilkd.* 2001;143(5):257-261.

Continues on page 71

# Mirataz™ (mirtazapine transdermal ointment)

For topical application in cats only. Not for oral or ophthalmic use.

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

**Before using this product, please consult the product insert, a summary of which follows:**

**INDICATION:** Mirataz™ is indicated for the management of weight loss in cats.

**DOSAGE AND ADMINISTRATION:** Administer topically by applying a 1.5-inch ribbon of ointment (approximately 2 mg/cat) on the inner pinna of the cat's ear once daily for 14 days. Wear disposable gloves when applying Mirataz™. Alternate the daily application of Mirataz™ between the left and right inner pinna of the ears. **See Product Insert for complete dosing and administration information.**

**CONTRAINDICATIONS:** Mirataz™ is contraindicated in cats with a known hypersensitivity to mirtazapine or to any of the excipients. Mirataz™ should not be given in combination, or within 14 days before or after treatment with a monoamine oxidase inhibitor (MAOI) [e.g. selegiline hydrochloride (L-deprenyl), amitraz], as there may be an increased risk of serotonin syndrome.

**HUMAN WARNINGS:** Not for human use. Keep out of reach of children. **Wear disposable gloves when handling or applying Mirataz™ to prevent accidental topical exposure.** After application, dispose of used gloves and wash hands with soap and water. After application, care should be taken that people or other animals in the household do not come in contact with the treated cat for 2 hours because mirtazapine can be absorbed transdermally and orally. However, negligible residues are present at the application site and the body of the cat at 2 hours after dosing. In case of accidental skin exposure, wash thoroughly with soap and warm water. In case of accidental eye exposure, flush eyes with water. If skin or eye irritation occurs seek medical attention. In case of accidental ingestion, or if skin or eye irritation occurs, seek medical attention.

**PRECAUTIONS:** Do not administer orally or to the eye. Use with caution in cats with hepatic disease. Mirtazapine may cause elevated serum liver enzymes (See **Animal Safety** in the product insert). Use with caution in cats with kidney disease. Kidney disease may cause reduced clearance of mirtazapine which may result in higher drug exposure. Upon discontinuation of Mirataz™, it is important to monitor the cat's food intake. Food intake may lessen after discontinuation of mirtazapine transdermal ointment. If food intake diminishes dramatically (>75%) for several days, or if the cat stops eating for more than 48 hours, reevaluate the cat. Mirataz™ has not been evaluated in cats < 2 kg or less than 6 months of age. The safe use of Mirataz™ has not been evaluated in cats that are intended for breeding, pregnant or lactating cats.

**ADVERSE REACTIONS:** In a randomized, double-masked, vehicle-controlled field study to assess the effectiveness and safety of mirtazapine for the management of weight loss in cats, 115 cats treated with Mirataz™ and 115 cats treated with vehicle control were evaluated for safety. The vehicle control was an ointment containing the same inert ingredients as Mirataz™ without mirtazapine. The most common adverse reactions included application site reactions, behavioral abnormalities (vocalization and hyperactivity), and vomiting. **See Product Insert for complete Adverse Reaction information.** To report suspected adverse events, for technical assistance or to obtain a copy of the SDS, contact Kindred Biosciences, Inc. at 888-608-2542. 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>.

**EFFECTIVENESS:** The effectiveness of Mirataz™ (mirtazapine transdermal ointment) was demonstrated in a randomized, double-masked, vehicle-controlled, multi-site field study involving client-owned cats of various breeds. Enrolled cats were ≥ 1 year of age and had existing documented medical history of ≥ 5% weight loss deemed clinically significant. The most common pre-existing conditions included renal insufficiency, vomiting, and hyperthyroidism. Some cats had more than one pre-existing condition. Cats were randomized to treatment groups in a 1:1 ratio of Mirataz™ to vehicle control. A total of 230 cats were enrolled and received either Mirataz™ (115 cats) or a vehicle control (115 cats) containing the same inert ingredients without mirtazapine. The cats were 2.8-24.6 years of age and weighed 2.1-9.2 kg. The dosage was a 1.5-inch ribbon (approximately 2 mg/cat) mirtazapine or vehicle ointment administered topically to the inner pinna of the cat's ear. A total of 177 cats were determined to be eligible for the effectiveness analysis; 83 cats were in the Mirataz™ group and 94 cats were in the vehicle control group. The primary effectiveness endpoint was the mean percent change in body weight from Day 1 to the Week 2 Visit. At Week 2, the mean percent increase in body weight from Day 1 was 3.94% in the mirtazapine group and 0.41% in the vehicle control group. The difference between the two groups was significant (p<0.0001) based on a two-sample t-test assuming equal variances. A 95% confidence interval on the mean percent change in body weight for the Mirataz™ group is (2.77, 5.11), demonstrating that the mean percent change is statistically different from and greater than 0.

**STORAGE:** Store below 25°C (77°F). Multi-use tube. Discard within 30 days of first use.

**HOW SUPPLIED:** Mirataz™ is supplied in a 5 gram aluminum tube.

**MANUFACTURED FOR:**

Kindred Biosciences, Inc.  
1555 Bayshore Highway, suite 200  
Burlingame, CA 94010

**NADA 141-481, Approved by FDA**

Made in USA.

NDC 86078-686-01

REG-MTZBS-008 Rev. 26Apr2018

Mirataz™ is a trademark of Kindred Biosciences, Inc. ©2018 Kindred Biosciences, Inc. All rights reserved.

## References

1. Atkins C, Bonagura J, Ettinger S, et al. Guidelines for the diagnosis and treatment of canine chronic valvular heart disease. *J Vet Intern Med.* 2009;23(6):1142-1150.
2. Harada K, Ukai Y, Kanakubo K, et al. Comparison of the diuretic effect of furosemide by different methods of administration in healthy dogs. *J Vet Emerg Crit Care (San Antonio).* 2015;25(3):364-371.
3. Brown S, Elliott J, Francey T, Polzin D, Vaden S. IRIS Canine GN Study Group Standard Therapy Subgroup. Consensus recommendations for standard therapy of glomerular disease in dogs. *J Vet Intern Med.* 2013;27(Suppl 1):S27-S43.
4. Suki WN, Yium JJ, Von Minden M, Saller-Hebert C, Eknayan G, Martinez-Maldonado M. Acute treatment of hypercalcemia with furosemide. *N Eng J Med.* 1970;283(16):836-840.
5. de Brito Galvão JF, Schenck PA, Chew DJ. A quick reference on hypercalcemia. *Vet Clin North Am Small Anim Pract.* 2017;47(2):241-248.
6. Setyo L, Ma M, Bunn T, Wyatt K, Wang P. Furosemide for prevention of cyclophosphamide-associated sterile haemorrhagic cystitis in dogs receiving metronomic low-dose oral cyclophosphamide. *Vet Comp Oncol.* 2017;15(4):1468-1478.
7. Plumb DC, ed. *Plumb's Veterinary Drug Handbook.* 8th ed. Stockholm, WI: Wiley-Blackburn; 2015.
8. Martinez-Alcaine MA, Ynaraja E, Corbera JA, Montoya JA. Effect of short-term treatment with bumetanide, quinapril and low-sodium diet on dogs with moderate congestive heart failure. *Aust Vet J.* 2001;79(2):102-105.
9. Adin D, Johnson PR, Kim CH, Nguyenba T, Rosen S. Long-term stability of a compounded suspension of torsemide (5 mg/mL) for oral administration. *J Vet Intern Med.* 2017;31(6):1822-1826.
10. Peddle GD, Singletary GE, Reynolds CA, Trafny DJ, Machen MC, Oyama MA. Effect of torsemide and furosemide on clinical, laboratory, radiographic and quality of life variables in dogs with heart failure secondary to mitral valve disease. *J Vet Cardiol.* 2012;14(1):253-259.
11. Chetboul V, Pouchelon IL, Menard J, et al. Short-term efficacy and safety of torsemide and furosemide in 366 dogs with degenerative mitral valve disease: the test study. *J Vet Intern Med.* 2017;31(6):1629-1642.
12. Cowgill LD, Langston C. Acute kidney insufficiency. In: Bartges J, Polzin DJ, eds. *Nephrology and Urology of Small Animals.* Oxford, UK: John Wiley and Sons; 2011:472-523.
13. Yozova ID, Howard J, Henke D, Dirkmann D, Adamik KN. Comparison of the effects of 7.2% hypertonic saline and 20% mannitol on whole blood coagulation and platelet function in dogs with suspected intracranial hypertension—a pilot study. *BMC Vet Res.* 2017;13(1):185.
14. Volovich S, Mosing M, Auer U, Nell B. Comparison of the effect of hypertonic hydroxyethyl starch and mannitol on the intraocular pressure in healthy normotensive dogs and the effect of hypertonic hydroxyethyl starch on the intraocular pressure in dogs with primary glaucoma. *Vet Ophthalmol.* 2006;9(4):239-244.
15. DiFazio J, Fletcher DJ. Updates in the management of the small animal patient with neurologic trauma. *Vet Clin North Am Small Anim Pract.* 2013;43(4):915-940.
16. Lulich JP, Osborne CA, Lekcharoensuk C, Kirk CA, Allen TA. Effects of hydrochlorothiazide and diet in dogs with calcium oxalate urolithiasis. *J Am Vet Med Assoc.* 2001;218(10):1583-1586.
17. Hezel A, Bartges JW, Kirk CA, et al. Influence of hydrochlorothiazide on urinary calcium oxalate relative supersaturation in healthy young adult female domestic shorthaired cats. *Vet Ther.* 2007;8(4):247-254.
18. Kittleson M. Therapy of heart failure. In: Ettinger S, Feldman E, eds. *Textbook of Veterinary Internal Medicine: Diseases of the Dog and Cat.* 4th ed. Philadelphia, PA: WB Saunders; 2000:713-737.
19. Trepanier LA. Choosing therapy for chronic liver disease. In: *Proceedings of the 33rd World Small Animal Veterinary Association World Congress.* Dublin, Ireland: WSAVA Congress; 2008.
20. Corvol P, Claire M, Oblin ME, Geering K, Rossier B. Mechanism of the antimineralocorticoid effects of spiro lactones. *Kidney Int.* 1981;20(1):1-6.
21. Brown S, Henik R. Therapy for systemic hypertension in dogs and cats. In: Bonagura J, ed. *Kirk's Current Veterinary Therapy: XIII Small Animal Practice.* Philadelphia, PA: WB Saunders; 2000:838-841.
22. Takemura N. Successful long-term treatment of congenital nephrogenic diabetes insipidus in a dog. *J Small Anim Pract.* 1998;39(12):592-594.
23. Bernay F, Bland JM, Häggström J, et al. Efficacy of spironolactone on survival in dogs with naturally occurring mitral regurgitation caused by myxomatous mitral valve disease. *J Vet Intern Med.* 2010;24(2):331-341.
24. Syme H. Hypertension in small animal kidney disease. *Vet Clin North Am Small Anim Pract.* 2011;41(1):63-89.
25. de Madron E, King JN, Strehlau G, White RV. Survival and echocardiographic data in dogs with congestive heart failure caused by mitral valve disease and treated by multiple drugs: a retrospective study of 21 cases. *Can Vet J.* 2011;52(11):1219-1225.
26. Herrtage ME. Endocrine disorders. In: Schaer M, ed. *Clinical Medicine of the Dog and Cat.* 2nd ed. London, England: Manson; 2010:451-504.
27. MacDonald KA, Kittleson MD, Kass PH, White SD. Effect of spironolactone on diastolic function and left ventricular mass in Maine coon cats with familial hypertrophic cardiomyopathy. *J Vet Intern Med.* 2008;22(2):335-341.

## DIAGNOSTIC/MANAGEMENT TREE ▶ CONTINUED FROM PAGE 22

Trevail T, Gunn-Moore D, Carrera I, Courcier E, Sullivan M. Radiographic diameter of the colon in normal and constipated cats and in cats with megacolon. *Vet Radiol Ultrasound.* 2011;52(5):516-520.

Washabau RJ. Constipation. In: Washabau RJ, Day MJ, eds. *Canine and Feline Gastroenterology.* St. Louis, MO: Elsevier; 2013:93-98.

Washabau RJ. Gastrointestinal motility disorders and gastrointestinal prokinetic therapy. *Vet Clin North Am Small Anim Pract.* 2003;33(5):1007-1028.

Washabau RJ, Hall JA. Diagnosis and management of gastrointestinal motility disorders in dogs and cats. *Compend Contin Educ Vet.* 1997;19(6):721-737.

Washabau RJ, Holt D. Pathogenesis, diagnosis, and therapy of feline

idiopathic megacolon. *Vet Clin North Am Small Anim Pract.* 1999;29(2):589-603.

Washabau RJ, Stalis IH. Alterations in colonic smooth muscle function in cats with idiopathic megacolon. *Am J Vet Res.* 1996;57(4):580-587.

White RN. Surgical management of constipation. *J Feline Med Surg.* 2002;4(3):129-138.

## Suggested Reading

Buffington CAT. Household resource checklist. *Clinician's Brief.* 2011;9(11):58.