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Preface: Year Three of This Journal: Bringing Future Developments in Veterinary Medicine Closer to Reality, *xv*

Philip H. Kass

SECTION I: BEHAVIOR

Factors to Consider when Selecting Puppies and Preventing Later Behavioral Problems, *1*

Ludovica Pierantoni, Eleonora Amadei, and Federica Pirrone

This review is aimed at going through current knowledge on all the factors that may have an influence on the development of behavioral problems in dogs. Moreover, by highlighting deficits and limitations of current knowledge, it aims to provide indications on how to best manage these delicate phases during the early life of puppies.

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Feline Behavioral Medicine – An Important Veterinary Discipline, *13*

Sarah Heath

Feline behavioral medicine is a relatively young veterinary discipline and it has been slow to

achieve recognition within the profession. One of the most important developments in the field of feline behavior is an increasing understanding of the fact that emotional and cognitive health are important components of overall health and are of equal significance to physical health, which has been the traditional focus of the veterinary profession. In order for behavioral medicine to become a more mainstream feature of veterinary practice, it is helpful to emphasize the fact that it is another form of internal medicine and requires a very similar approach in terms of diagnosis and selection of management and treatment approaches for specific reported behavioral concerns. In addition, taking a behavioral medicine approach to veterinary practice enhances the diagnosis and treatment of physical disease in patients with feline.

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Peripheral Concentration of Amyloid- β , TAU Protein, and Neurofilament Light Chain as Markers of Cognitive Dysfunction Syndrome in Senior Dogs: A Meta-analysis, 23

Patrizia Piotti, Mariangela Albertini, and Federica Pirrone

Canine cognitive dysfunction syndrome (CCDS) is an age-related neurodegenerative disease. The authors reviewed and performed a meta-analysis of the literature covering in vivo peripheral markers for CCDS. The quantitative analysis focused on 6 papers on amyloid- β 40 and 42 in the serum or plasma. Fixed effect models indicated a significant difference between dogs with CCDS and healthy senior controls in the pooled effect for A β 42, but not A β 40, showing moderate heterogeneity. Overall, the evidence for clinical use of A β as a peripheral marker of CCDS is not sufficient, but the current findings suggest that it is worthy of further research.

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SECTION II: DIAGNOSTIC IMAGING

Cardiac Computed Tomography Imaging, 39

Brian A. Scansen

The heart is a 3-dimensional structure, yet nearly all cardiac imaging performed in animals relies on 2-dimensional imaging techniques such as radiography, fluoroscopy, and ultrasonography. Cross-sectional imaging of the heart using cardiac computed tomography (cCT) allows visualization and reconstruction of cardiac anatomy in unique and useful ways and is particularly useful for planning surgical or catheter-based interventions. This review provides an overview of the technical aspects required for cCT as well as methods to optimize imaging protocols, with particular focus on aspects relevant to imaging small animals.

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Advanced Imaging of the Pancreas, 57

Lauren von Stade and Angela J. Marolf

Disorders of the pancreas in dogs and cats are often difficult to diagnose with radiographic and conventional ultrasonographic methods. The increased availability and research advancement in imaging technologies including contrast-enhanced ultrasonography, computed tomography, and magnetic resonance imaging are improving clinician options for the detection of diseases such as acute pancreatitis and pancreatic neoplasia, including insulinoma and adenocarcinoma. Advantages of these modalities include detailed assessment of full anatomy, decreased operator dependence, improved patient comfort, and evaluation of organ perfusion. Advanced imaging is now considered the gold standard for the detection and evaluation of pancreatic disease and associated sequelae.

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Update on Magnetic Resonance Imaging of the Brain and Spine, 73

Silke Hecht

Compared to radiography, ultrasound, and computed tomography (CT), magnetic resonance imaging (MRI) is considered a

“newcomer” in the world of diagnostic imaging. The first MR imaging-related articles were published in the late 1970s and early 1980s. Reports on the use of MRI in animals were largely limited to animal models at that point. Over the following decades and with increasing recognition of the superb imaging capabilities of MRI in combination with the apparent low risk to patients, MRI research and clinical use especially in the area of neurology rapidly grew in both human and veterinary medicine. Today, with few exceptions, MRI is generally recognized as the gold standard for the evaluation of the central nervous system in people and animals. MRI advances over time included improvement of available hardware (eg, type of magnet) and development/improvement of imaging techniques (eg, specialized MRI sequences). This article provides a brief comparison between low and high field MRI systems, gives an overview of recent advances in imaging technology as it pertains to small animal neuroimaging, provides recommendations for MRI protocols for the imaging of the canine and feline brain and spine, and discusses possible limitations of MRI in the evaluation for certain neurologic diseases in dogs and cats.

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SECTION III: GASTROENTEROLOGY

Modifying the Gut Microbiota – An Update on the Evidence for Dietary Interventions, Probiotics, and Fecal Microbiota Transplantation in Chronic Gastrointestinal Diseases of Dogs and Cats, 95

Silke Salavati Schmitz

Modifications of the intestinal microbiota can be achieved by dietary manipulations, introduction of probiotics, and fecal microbiota transplantation (FMT). Most dietary changes have a moderate impact on microbiota composition and diversity. For individual macro- and micronutrients such as dietary fiber and other prebiotics, changes in “gut health” parameters have been observed in healthy animals, but the effect on gastrointestinal disease is less clear. For probiotics, results are mixed, likely due to the use of different probiotic strains, dosages, durations, and the assessment of different outcomes. While FMT is a promising new treatment modality, information on its optimal use in small animals is currently too scarce to make recommendations.

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Nutrition in Canine and Feline Gastrointestinal Disease, 109

Aarti Kathrani

This comprehensive review focuses first on the principles of nutritional management of canine and feline gastrointestinal diseases by detailing the process of nutritional assessment of the patient, the current diet, feeding management,

environment, and reassessment and monitoring once the chosen dietary strategy has been implemented. Then a detailed review of the relevant nutritional strategies for the management of acute gastroenteritis, adverse reaction to food, chronic inflammatory enteropathy, intestinal lymphangiectasia, and feline constipation is provided.

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Challenges in Differentiating Chronic Enteropathy from Low-Grade Gastrointestinal T-cell Lymphoma in Cats, 121

Julien Dandrieux and Valérie Freiche

Chronic enteropathies (CEs) are common diseases, particularly in elderly cats. The differentiation between CE and low-grade gastrointestinal T-cell lymphoma (LGITL) remains challenging. The end diagnosis is reached by combining clinical signs with gastrointestinal tract sampling for histology, immunohistochemistry, and molecular testing. There is currently a lack of international guidelines on molecular testing, with variable results depending on the laboratory used. The clinician needs to keep this in mind when requesting and interpreting a test. Although LGITL is neoplastic, the progression is slow, and most cats can be stabilized for 2 years or more with a combination of prednisolone and chlorambucil.

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Update on Acute Hemorrhagic Diarrhea Syndrome in Dogs, 133

Kathrin Busch and Stefan Unterer

Clostridial overgrowth and associated release of their toxins is responsible for the pathogenesis of acute hemorrhagic diarrhea syndrome. Diagnosis is based on exclusion of other causes for acute hemorrhagic diarrhea, because only invasive tests, such as small intestinal biopsies identifying clostridial colonization on the surface of a necrotic intestinal mucosa, support a diagnosis. These are not usually performed in unstable, hypovolemic patients with an acute disease. In the absence of complications, most dogs rapidly improve with intensive fluid replacement and symptomatic therapy. The short-term prognosis is good, but one-third of dogs develop signs of chronic gastrointestinal disease later in life.

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SECTION IV: INFECTIOUS DISEASE

Feline Immunodeficiency Virus: Current Knowledge and Future Directions, 145

Paweł M. Bęczkowski and Julia A. Beatty

Based on clinical observations and the increasing number of published reports, it is evident that many feline immunodeficiency virus (FIV)-positive cats display mild or inapparent clinical signs and frequently achieve normal life spans. Although the clinical manifestation of infection is determined by unknown viral, host, and environmental factors, the relative intrahost genetic stability of FIV may play an important role in the apparent clinical stability observed in many naturally infected cats. Performance of the commercial Fel-O-Vax FIV vaccine documented in recent field studies is suboptimal, reminding us that the fully efficacious lentiviral vaccine remains elusive.

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Diagnostic Testing for Infectious Respiratory Tract Disease, 161

Sean E. Hulsebosch, Jennifer C. Chan, and Lynelle R. Johnson

Infectious disease testing is critical for the effective diagnosis of nasal, airway, parenchymal, and pleural space disease in dogs and cats because appropriate therapy requires an accurate diagnosis. While performing rhinoscopy, tracheal wash, bronchoscopy, or thoracocentesis, the clinician should be mindful of tests available for various infectious disease while procuring samples; these tests include cytology, bacterial and fungal cultures, histopathology, and polymerase chain reaction testing. Confirming a role for infection in respiratory disorders will allow appropriate antimicrobial stewardship and avoid development of resistant infections.

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Canine Leptospirosis – Global Distribution, Diagnosis, and Treatment, 177

Christine Griebsch, Michael P. Ward, and Jacqueline M. Norris

Canine leptospirosis is a potentially fatal bacterial disease of global importance resulting in acute kidney injury in most affected dogs, while many will have hepatic and some hemorrhagic and pulmonary involvement. Infecting serovars and seroprevalence vary between geographic regions and despite an abundance of literature there are knowledge gaps due to differences in study design and limitations in available diagnostic tests. While new diagnostic tests including point-of-care tests and molecular methods are being developed, a combination of the microscopic agglutination test (MAT) (acute and convalescent titers) and PCR in blood and urine are recommended. The mainstay of prevention is risk mitigation tailored to different geographic regions taking epidemiological data (including reservoir hosts) into account. Vaccination is inconsistent in preventing disease and is influenced by the infecting serovar(s) and valency of the vaccine.

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SECTION V: NUTRITION

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Daniel L. Chan

Medical management of acute pancreatitis has shifted from the concept of “pancreatic rest” to early reinitiation of enteral feeding as soon as it is feasible. This shift is due to improved understanding of the pathophysiology of acute pancreatitis and growing evidence of the benefits of enteral feeding in this disease. Nutritional planning for patients with acute pancreatitis centers on nutritional assessment, selecting the most appropriate approach of nutritional support, and initiating enteral feeding as soon as it is feasible. Monitoring for tolerance of enteral feeding and adjusting the nutritional plan as appropriate is key in the management of these patients.

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Creating a Weight Loss Plan with Owner Engagement, 229

Camille Torres and Jonathan Stockman

The obesity epidemic affects more than half of dogs and cats in westernized countries. This disease has several negative implications on the quality of life, risk of concurrent disease, and longevity. Many pet owners may not recognize their pet is obese or realize the implications of obesity. Weight loss is a lengthy process that requires the owner’s commitment and diligence. There are multiple hurdles that can impede a successful outcome; however, there are steps that the veterinary team can take to mitigate some of the challenges during the pet’s weight loss and increase the chances for success.

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