Zoo and Wild Animal Medicine—5th Edition

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BOOK REVIEW . . .

Zoo and Wild Animal Medicine. 5th Edition. Edited by M. E. Fowler and R. E. Miller. W. B. Saunders Co., Philadelphia, Pennsylvania, USA. 2003. 782 pp. $134.00 (hardback).

The publishing of the fifth edition of *Zoo and Wild Animal Medicine* represents a return to its original lineage. Editions 1 and 2 by Fowler have been mainstay reference texts for those practicing and teaching zoo and wildlife medicine. These textbooks provided comprehensive coverage of clinical and preventative medicine across a broad spectrum of animal orders. In contrast, edition 3 by Fowler and edition 4 by Fowler and Miller presented detailed treatment of selective topics, rather than attempting to cover broad medical issues across many taxa. Motivated by an apparent long-awaited reader demand, the editors have organized the fifth edition in the mold of the original works by Fowler, providing comprehensive and systematic coverage of medicine across multiple animal taxa. The general outline of the book includes 80 chapters within six categorical sections based on taxonomic classes, including fish (one chapter), amphibians (three chapters), reptiles (five chapters), birds (23 chapters), mammals (32 chapters), and a final section dedicated to a variety of diseases common to multiple species (16 chapters). Editorially, this was a massive undertaking, coordinating the written work of 76 diverse coauthors, most of whom are well recognized in the fields of zoological and wildlife medicine.

This edition is an excellent reference text, the writing of which is directed at veterinarians working with zoological collections or free-ranging wildlife species. Several chapters have included detailed natural historic, biologic, and epidemiologic information, which nonveterinary scientists might find valuable as well. The major format shift in this edition, compared to previous editions, is an emphasis on providing information in tables, presumably an editorial decision in order to present a large amount of information in the least amount of space. Many of the chapters include tables summarizing infectious and noninfectious diseases in a columnar format, with headings such as disease, etiologic agent, epizootiology, clinical signs, diagnosis, and management/treatment. This movement away from detailed descriptions of disease, which was a mainstay of editions 1 and 2 by Fowler, is both an asset and a shortcoming. Although the tables offer readily accessible information within confined space, some are stylistically difficult to read, and lack sufficient detail of descriptive text. Additionally, much of the written and tabular text is limited by an overall lack of cited primary references.

Part 1, *Fish*, includes a single chapter devoted to fish medicine. This chapter provides a thourough and well-organized overview of fish medicine, including detailed taxonomic information, specialized anatomic and physiologic adaptations, and a helpful section on preventive medicine (quarantine, vaccines, and therapeutics). Although this chapter summarizes general fish medicine well, the editors might have chosen to expand this section to include several chapters covering fish medicine directed at specific orders or classes of fishes. Teleosts, for example, could have been subdivided into salmonids, catfish, and marine and freshwater tropicals, and other chapters could have focused on the medicine of ray-finned fishes or elasmobranchs. The expectation of quality medical management of fishes in zoological institutions, aquaria, and aquacultural facilities worldwide demands that the generic "fish" in fish medicine be differentiated. This section could have also incorporated chapters on aquatic and terrestrial invertebrate medicine as well.

Part 2, *Amphibian Groups,* includes three chapters, each covering one amphibian order. This section provides a good overview of amphibian medicine. The tables describing infectious diseases are clear and well organized. There are a few editorial errors involving drug dosages or concentrations, which is problematic in a reference text. For example, in the chapter on anurans, table 2-2 lists tricaine methanesulfonate as an injectable chemical at a concentration of 1–2 g/l, which should read bath immersion at the same concentration. Table 2-2 also lists clove oil as an immersion (0.3–0.5 ml/l), which would be better presented as a stock solution in mg/l. This assumes that all clove oil is created equal, which is not true, because clove oil formulations can vary from 80% to 100% active ingredients (eugenol plus eugenol acetate). In the same table, bubbling isoflurane gas into an immersion bath for anesthesia should include an occupational health warning. In the chapter on Urodela, tables including antimicrobial dosages (tables 3-7 and 3-9) are valuable. Lack of primary references associated with tabulated drug dosages, worldwide amphibian decline, and reproduction is somewhat frustrating, but this is not unique to these chapters.

Part 3, *Reptile Groups,* includes five chapters, each chapter covering one reptile order. This section is well done, with more descriptive

information and an emphasis on diagnostic procedures. It is evident that there was some concerted group effort by the authors of the reptile chapters to focus less on presenting data in tabular form, although the tables in these chapters are informative and easy to read. Descriptive information on clinical procedures, hematology, surgical procedures, and treatments are excellent, particularly in the Chelonia, Ophidia, and Lacertilia chapters. Some images are blurred in the Crocodilia chapter, which is a minor distraction from an otherwise instructive chapter.

Part 4, *Avian Groups,* includes 23 chapters covering most avian orders. This section provides a great deal of useful biologic as well as medical information. The avian section is where substantial tabulated data begins in earnest. Although I found most of the tables useful for quick reference, many are cumbersome with inconsistent formatting between authors. The chapters on ratites and penguins use fewer tables, whereas the psittacine and falconiform chapters provide the majority of information in table form. The chapter on ratites has well-described comparative morphologic data between orders, but lacks specific information regarding anesthetics and therapeutics. Additional information on egg incubation and pediatrics would have been useful in this chapter. The chapter on penguins has an interesting section on special physiologic adaptations and an excellent discussion of avian malaria. However, there are a few typographic errors, including a salt supplementation dosage of 0.15 g/kg/day, which gets translated by the author to 5 g/3 kg bird (it should have been 0.45 g/3 kg bird). Some chapters present data from wild-caught birds (e.g., aquatic birds) because little captive information exists, whereas others focus on captive populations (e.g., anseriforms, cranes, and psittacines). There are particularly good descriptions of the natural history and biology of the aquatic birds, phoenicopteriforms, columbiforms, anseriforms, strigiforms, caprimulgiforms, trochiliforms, apodiforms and coliiforms, trogoniforms, and coraciiforms.

Part 5, *Mammal Groups,* includes 32 chapters covering the majority of mammalian orders. This section starts with two excellent chapters on monotremes and marsupials, both chapters blending tables and descriptive information successfully. The monotremes chapter describes practical venapuncture methods, and provides a brief descriptive paragraph on therapeutics. Biologic/physiologic sections in chiropteran and prosimian chapters provide some unique parameters, and the prosimian chapter employs a useful compare and contrast format. The chapter on nonhuman primates (excluding great apes) provides detailed tables outlining significant diseases, but the 17 pages of tabular data are overwhelming at first glance. Interspersed between these tables are two useful tables describing therapeutic agents and their dosages. Other extremely detailed and constructive chapters in this section include those on great apes, Rodentia, Cetacea, Pinnepedia, Canidae, Rhinoceridae, Camelidae, and Bovidae.

Part 6, *Diseases Common to Multiple Taxa,* includes 16 chapters covering a variety of important infectious and noninfectious diseases, which affect multiple species. These chapters, by virtue of their detailed treatment of defined topics, are more comprehensive and provide excellent reviews of diseases as varied as rabies and metabolic bone disease, and include expanded descriptions of etiology, epidemiology, pathophysiologic mechanisms and manifestations, and control and prevention. Most of these chapters provide excellent disease reviews, with particularly outstanding treatment of metabolic bone disease, plague, anthrax, toxoplasmosis, tuberculosis, chlamydiosis, rabies, and poxviruses.

The text succeeds in attempting to provide the reader with a great deal of information within relatively short chapters, making it an excellent reference. Conversely, the lack of consistent descriptive details throughout the chapters makes it more difficult to use as a clinical resource. Current vaccination protocols are conspicuously absent in most chapters, and could have easily been incorporated into the table format. Clinical veterinarians in zoological medicine often reach for references that provide quick information on diagnostic techniques or drug (e.g., anesthetic or antimicrobial) dosages. This information is present in many of the chapters, but may need to be highlighted. A perplexing aspect of this edition is the minimization of references in each chapter, which presumably was an editorial decision. Most authors limited their reference section to less than 25 total citations, which restricts the ability of the reader to either substantiate or challenge information presented as factual. To give credit, a few authors make it clear that their reference list is not exhaustive (e.g., Marsupialia) or cite additional resources (e.g., Crocodilia).

This text is still an excellent and much appreciated reference, and a "must have" for all veterinarians working with captive and free-ranging zoological species. It should be considered an obligatory reference text for all residents, interns, and veterinary students with an interest in zoological medicine. The return to a multiple-taxon approach was long awaited and appreciated, as it provides "one-stop shopping"

for reference material. I look forward to a continuation of the multiple-taxon format in future editions of *Zoo and Wild Animal Medicine,* although a return to the descriptive format that worked so well in the original editions would be beneficial. If budgetary constraints were the villain limiting the size and scope of this edition, then I stridently commend the editors and authors for synthesizing and organizing a large amount of information under restrictive guidelines. The editors and authors should be congratulated for providing us with our Fowler "fix" for the next several years, as we look forward to the sixth edition.

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