AMPHIBIAN MEDICINE
AND
CAPTIVE HUSBANDRY
Drawing by Quade Paul
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Dedicated to my lovely wife, Marlene, who has lived through the ancient curse of “interesting times” ever since linking up with me. Marlene has cared for the hundreds of beating hearts that are our unusual family, and supported me through the various twists and turns of my professional life. Recognition is also due my parents, Don and Jean, who were the most incredible parents a young herpetologist could have. Even the occasional loose snake popping up in their bathroom was met with considerable aplomb. They gave me the freedom and support to follow my dreams. Thanks also to my grandmother, Grace, who gave me my first redfoot tortoise when I was six. I’ve met few other people that rival her love of creatures and zest for life. And finally, the parade of lives that have shared their time with me: Spotty, Heidi, Hyla, Svetlana, Chichirivichi, Barnaby, the Imp, Rana, Wally, Charlie, Mr. Smartypants, Apollo, Bubbles, Chani, Apaula, Bob, Butthead, Thing 1 and Thing 2, Rana, Lola, Mbongo, Dongo, Zongo, Peaches, Succubus, Incubus, Corey, Schlemoe, Popeye, Tippie, Rascal, Flower, Spotty, Herman, George, Altair, Scooter, Chet, Abercromby, Suri, Sassy, Sweet-ums, Cleo, Gorgo, and a thousand others.

Kevin M. Wright, DVM

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Brent R. Whitaker, MS, DVM
Sandra L. Barnett, MA, Senior Herpetologist, National Aquarium in Baltimore, Baltimore, MD

Val B. Beasely, DVM, PhD, Diplomate ABVT, Professor of Veterinary and Ecological Toxicology, Department of Veterinary Biosciences, College of Veterinary Medicine, University of Illinois at Urbana-Champaign, Urbana, IL

John F. Cover, Jr., BS, Curator of the Rainforest Exhibits, National Aquarium in Baltimore, Baltimore, MD

Stephen G. Diana, MS, DVM, Clinical Research Investigator, Animal Health/Clincial Affairs, Pfizer, Inc., Groton, CT


John C. Harshbarger, PhD, Professor of Pathology and Director of Registry of Tumors in Lower Animals, George Washington University Medical Center, Washington, DC

Sandy McCampbell, CAHT, Veterinary Technician, Department of Animal Health, Philadelphia Zoological Garden, Philadelphia, PA

Donald K. Nichols, DVM, Diplomate ACVP, Associate Pathologist, Department of Pathology, National Zoological Park, Washington, DC

Sarah L. Poynton, PhD, Lecturer, Division of Comparative Medicine, The Johns Hopkins University School of Medicine, Research Associate, National Aquarium in Baltimore, Baltimore, MD

Mark D. Stetter, DVM, Diplomate ACZM, Veterinary Operations Manager, Disney Animal Programs, Walt Disney World, Orlando, FL

Sharon K. Taylor, DVM, PhD, Wildlife Manager, Diagnostic Veterinarian Manager, Florida Fish and Wildlife Conservation Commission, Gainesville, FL

Brent R. Whitaker, MS, DVM, Director of Animal Health, National Aquarium in Baltimore, Baltimore, MD

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Founded in 1911, the Department of Art as Applied to Medicine was the first of its kind in the world. Johns Hopkins University has trained medical illustrators to advance medical and scientific education internationally for over eighty years. Its graduates continue the Hopkins’ tradition of excellence into the 21st century.

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Rarely do we stop to consider how important amphibians are in our lives. For many of us, our first contact with an amphibian was that frog or toad we encountered during our youth in the back yard or in the park, or we might have seen a redback salamander underneath a log. Our next encounter with amphibians was most likely in high school or in undergraduate school where we dissected a frog in a biology or comparative anatomy class. In veterinary school we may have used the frog muscle in the study of muscle physiology. The point is that amphibians were not high profile animals, not charismatic megavertebrates such as many mammals, and they certainly were not the primary subject in any veterinary text on animal health. Indeed until now there has been no text fully devoted to the health and diseases of these oftentimes colorful and always fascinating creatures.

Although our experience with amphibians has been limited, they have been used as laboratory research animals for more than a century. In addition to their more classic role in developmental biology, amphibians have also been used in the study of comparative, developmental and transplantation immunology, susceptibility to toxicants, teratogen screening, limb regeneration, osmoregulation, physiology and endocrinology of metamorphosis, and embryology and hormone assays. Yet our understanding of amphibian health and disease has been meager. Hence, our ability to provide proper veterinary care for amphibians under captive conditions has been limited.

For more than 50 years, many amphibian species have markedly declined in numbers. Many of these declines have been attributed to adverse human influences acting on local populations of amphibians. However, by the late 1980s herpetologists from many parts of the world were seeing declines in amphibian populations in what appeared to be pristine habitats. With these observations came the suggestion that there may be one or more global factors that are adversely affecting amphibians. By 1991 the concern became so great that the Declining Amphibian Populations Task Force was established by the Species Survival Commission of the World Conservation Union. The Task Force, operating through a network of Working Groups worldwide, collect geographical data on amphibian declines and their causes, and distribute small grants to initiate research projects in key areas.

Recently amphibians have “enjoyed” more public attention. In the summer of 1995, a large number of frogs were discovered in Minnesota with misshapen, extra, or missing limbs. Since then and continuing on to the present time, scientists have been seeking the causes for this phenomenon. Hypotheses abound with many pointing to xenobiotic chemicals as at least one of the reasons for this apparent large increase in amphibian malformations. What drives the interest in and research into the causes of malformed frogs is not purely because of the amphibian itself but rather because of the potential for effects on human health. It would appear that the amphibian is becoming the “canary of the miner” in our modern time as the amphibian is sensitive to numerous stressors in the aquatic environment and may forecast serious threats to our own species.

As noted above, veterinarians have very few sources of information on the health and disease of amphibians. What we have had in the past were single chapters in texts on reptiles or laboratory animal medicine. This text fills a great void in our knowledge of amphibians. Drs. Kevin Wright and Brent Whitaker, along with the
individual chapter authors, are to be congratulated for their foresight and dedication to producing a text that provides us with the necessary information to care for amphibians, whether they be private pets, laboratory animals, zoo and aquarium exhibits, or found in the wild. Thanks for a job well done!

Wilbur B. Amand, VMD
Executive Director
American Association of Zoo Veterinarians and
Association of Reptilian and Amphibian Veterinarians
Adjunct Professor, University of Pennsylvania School of Veterinary Medicine
Amphibian Medicine and Captive Husbandry began back in the late 1980's when I suggested to my classmate, Brent, that we should write a book on amphibian medicine. I don’t remember his exact response at the time, but considering his tolerance (and even enjoyment) of the non sequiturs I spout on a minute by minute basis, I imagine that I received the answer, “Yes, we should do that.” Amphibians were a class of animals that were sadly neglected by the professors who taught at my school. This state of affairs was not restricted to the University of Florida (which indeed put more effort into exotic animal medicine than any other school at the time except, perhaps, the University of California at Davis). Somehow, despite being linked to a rather eccentric and offbeat human being who, at times, sported half a beard and wore boxer shorts below cut-off shorts way before it became hip, Brent managed to become staff veterinarian at the National Aquarium in Baltimore, an institution that houses a vast collection of neotropical frogs. With a few more stops, I ended up curator for a smaller but still respectable collection of amphibians that included frogs, salamanders and caecilians. And, after all those years, I once again had the audacity to suggest that we knew enough to put together a book on amphibian medicine.

Elaine Harland took the time to listen to me at the International Herpetological Symposium in Miami, Florida. Several months later, Brent and I started living a life of strange disquiet right after the ink dried on the contract with Krieger Publishing Company.

This book focuses on the literature published in the English language, and is biased heavily toward American publications. It is intended as a good starting point for the clinician interested in amphibians, as well as the most complete reference currently available for those with a strong interest in amphibian medicine.

Undoubtedly this text contains information that will be obsolete or proven erroneous within a few years. Amphibian medicine is in its infancy and needs to develop quickly to catch up with other fields in medicine. Take the time to document your experience, positive or negative, and get that information into print, preferably in a peer-reviewed journal. The field is wide open, and with the appropriate effort anyone can make a contribution. Some people may strongly disagree with the interpretation of the material presented herein, and it is our hope that those with such material to refute our presentation take the time to publish their experience through a peer-reviewed journal. Such information should be disseminated widely, not locked inside their heads.

The information contained within this text has few absolutes. The techniques and drug dosages are ones that have proven effective in many species or, at worst, done no harm. Extra-label use applies to the entire field of amphibian medicine, and the client should be so advised with each and every treatment administered. The risk of treatment failures and the possibility of adverse reactions should be explained carefully to the client before initiating any treatment or procedure with an amphibian. Above all, don’t forget the basic tenets of practicing medicine just because your patient is green, coated with mucus and hops. The information contained herein is intended as a guide only, and no responsibility for treatment success or failure is assumed or implied. New information is constantly becoming available, and the clinician must make the effort to keep current with theories and practices involved in all aspects of veterinary medicine.

Enough said. Enjoy.

Kevin M. Wright, DVM