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Preface

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J. Jill Heatley

Cardiac Biology and Disease in Invertebrates

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David Williams

It may seem ridiculous to consider cardiac diseases in sub-vertebrate animals; when on earth is a tarantula, a butterfly or a snail going to be presented as a clinical case with heart failure or a congenital cardiac abnormality? This article examines the work of research groups investigating invertebrates as valuable models of heart disease in man. Examining invertebrates with *gene defects similar to those in human patients with heart disease, congenital or acquired*, allows us to probe deeply into the aetiopathogenesis of many cardiac conditions.

Fish Cardiovascular Physiology and Disease

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Johanna Sherrill, E. Scott Weber III, Gary D. Marty,
and Stephen Hernandez-Divers

Fish patients with cardiovascular disorders present a challenge in terms of diagnostic evaluation and therapeutic options. Veterinarians can approach these cases in fish using methods similar to those employed for other companion animals. Clinicians who evaluate and treat fish in private, aquarium, zoologic, or aquaculture settings need to rely on sound clinical judgment after thorough historical and physical evaluation. Pharmacokinetic data and treatments specific to cardiovascular disease in fish are limited; thus, drug types and dosages used in fish are largely empiric. Fish cardiovascular anatomy, physiology, diagnostic evaluation, monitoring, common diseases, cardiac pathologic conditions, formulary options, and comprehensive references are presented with the goal of providing fish veterinarians with clinically relevant tools.

Cardiovascular Physiology and Diseases of Amphibians

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Kathleen M. Heinz-Taheny

The class Amphibia includes three orders of amphibians: the anurans (frogs and toads), urodeles (salamanders, axolotls, and newts), and caecilians. The diversity of lifestyles across these three orders has accompanying differences in the cardiovascular anatomy and physiology allowing for adaptations to aquatic or terrestrial habitats, pulmonic or gill respiration, hibernation, and body elongation (in the caecilian). This article provides

a review of amphibian cardiovascular anatomy and physiology with discussion of unique species adaptations. In addition, amphibians as cardiovascular animal models and commonly encountered natural diseases are covered.

Normal Reptile Heart Morphology and Function

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Jeanette Wyneken

Major differences among reptile taxa include the shape of the heart, degree of separation of the ventricular compartments, degree of development of the intraventricular muscular ridge, and in crocodylians, the inter-ventricular septum. In many cases, the structural-functional features of the reptilian heart provide adaptive plasticity, allowing for the ecological and behavioral diversity seen. As a result, variation may surface in clinical measures of cardiac performance. This article updates clinical context, *provides an understanding of the variation in reptilian cardiovascular systems*, and their functional implications for the assessment and treatment of reptile patients.

Reptile Cardiology

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Mark A. Mitchell

Cardiovascular disease in reptiles generally is considered an uncommon finding in captive animals, but no large-scale, cross-sectional studies have been performed to determine its prevalence. It is possible that cardiovascular disease is more common than is generally accepted and that the current belief results from limited clinical and diagnostic experience. This article offers guidance drawn from the author's clinical experience and the available literature. It is important that veterinarians pursue a thorough history, physical examination, and diagnostic work-up when managing cardiovascular disease in a reptile case. Veterinarians working with these cases should document their findings and share them with their colleagues to build an evidence-based foundation for reptile medicine.

Cardiovascular Physiology and Diseases of Pet Birds

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Michael Pees and Maria-Elisabeth Krautwald-Junghanns

Avian cardiac disease in pet birds occurs more often than previously assumed. The article focuses on anatomic peculiarities of the avian cardiovascular system and common diseases. Diagnostic possibilities are demonstrated, and therapeutic measures are discussed.

Cardiovascular Anatomy, Physiology, and Disease of Rodents and Small Exotic Mammals

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J. Jill Heatley

Cardiovascular disease in small exotic mammals is anecdotally common, but clinical reports of diagnosis and treatment of disease are rare. This article focuses on known causes of cardiovascular disease in the small exotic mammal. Normal anatomy and physiology, as it differs from the dog and cat, is also highlighted. Cardiomyopathy, dirofilariasis, atrial thrombosis, and other acquired and congenital cardiac and vascular diseases of rodents, hedgehogs, sugar gliders, raccoons, opossums, and skunks are reviewed. Expected clinical signs and diagnostic and treatment options, including a formulary, are provided for these species.

Ferret Cardiology

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Robert A. Wagner

Cardiac disease in pet ferrets is common and includes dilated cardiomyopathy, arrhythmias, and acquired valvular disease. Clinical presentation of cardiac disease in ferrets may be similar to dog or cats, although hind limb weakness may be a prominent feature. Radiography, ECG, and ultrasound are all useful tools in the diagnosis of cardiac disease in ferrets. Therapeutics for cardiac disease in ferrets is based on recommendations for dogs and cats. The prognosis for cardiac disease in ferrets varies from fair to guarded, depending on underlying disease.

Cardiovascular Physiology and Diseases of the Rabbit

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Romain Pariaut

This article reviews what is known about the diagnosis and management of cardiovascular diseases in the pet rabbit. Current knowledge is based on anecdotal reports, derived from research data using the rabbit as an animal model of human cardiovascular diseases, but most importantly canine and feline cardiology. It is likely that, as cardiovascular diseases are more often recognized, more specific information will soon become available for the treatment of the pet rabbit with cardiac disease.