

# Evidence-Based Advances in Reptile Medicine



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## KEYWORDS

- Evidence-based • Diagnosis • Disease • Pathogen • Reptile • Statistics
- Therapeutic

## KEY POINTS

- Inclusion body disease, a plague in snake collections, has been found to be associated with the presence of arenavirus in affected snakes.
- Ranavirus is highly pathogenic to red-eared sliders (*Trachemys scripta elegans*), and experimentally infected animals suffer significant mortalities from this pathogen.
- Corn snakes (*Pantherophis guttatus*) and ball pythons (*Python regius*) respond differently to ultraviolet B exposure.
- Osmolalities in reptiles can be highly variable and should be determined on a species-by-species basis.
- Positive pressure ventilation can be used to manage respiratory depression in sea turtles.

## INTRODUCTION

The first herpetological medicine society, the Association of Reptile and Amphibian Veterinarians (ARAV), has been in existence for more than 25 years (originated 1991). This professional association initially produced the Bulletin of the ARAV (BARAV) to disseminate scientific material to members. This continued for 10 years, at which time the ARAV transitioned into an official journal, the *Journal of Herpetological Medicine and Surgery* (JHMS), with volume 10 issue 1. In both cases, the ARAV sought to serve as a repository for peer-reviewed, evidence-based knowledge. Early on, much of the literature produced in the BARAV and JHMS was based on case reports and brief communications. Although these types of materials can serve as important initial sources of knowledge for clinicians, they are limited to single cases and descriptive material. Over time, the JHMS has expanded to include cross-sectional studies, case-control studies, and experimental or interventional studies

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that provide evidence-based knowledge. The *Journal of Zoological and Wildlife Medicine* (JZWM) and the *Journal of Exotic Pet Medicine* (JEPM) are other nondomestic species journals that routinely publish on herpetological medicine too; they too often provide a mixture of hypothesis-driven research articles, brief communications, and case reports.

A primary reason that there is limited evidence-based research available for reptiles is because of the low number of specialists working in the field. The growth of the evidence-based medicine in most specialties can be tied to the increasing number of diplomates associated with the specialty, especially when these individuals are in academic institutions where there is an expectation to produce scholarship. In the United States, there are currently less than 6 individuals with specialty certification in reptile medicine in academic environments. However, this is not what should define how prolific evidence-based medicine is for a specialty. All veterinarians working in a field should consider themselves clinician scientists and feel an obligation to their profession to produce scholarship. Case-control studies, cross-sectional studies, and clinical trials can often be accomplished using available patients and limited resources. Collaboration between specialists and institutions can provide more robust studies and data sets to provide the herpetologic medicine community with solid evidence to develop educated diagnostic and therapeutic plans. Evidence-based knowledge in reptile medicine will not grow until the veterinarians practicing in the field heed the call to contribute to its development.

## EVIDENCE-BASED ADVANCES IN DIAGNOSTICS

Veterinarians rely on clinical pathology data to assess the physiologic status of their patients. This type of data can provide important insight into the current state of an animal and help to guide treatment. However, this type of data is not without its shortcomings. To interpret the results of hematologic and biochemistry data, it is important to have species-specific reference intervals for comparison and know that the specific methods used to analyze the sample were validated for that species. Unfortunately, this has not been done for very many reptiles, and with more than 10,080 species in the class,<sup>1</sup> it is not likely to occur at any point in the future. Therefore, when the opportunity does arise to evaluate these types of questions for a particular species, it can be used as a reference for others.

Proteins are important constituents found in the blood. There are many different types of proteins, including albumin and the alpha, beta, and gamma globulins, to name a few. Chemistry analyzers typically measure total protein and albumin concentrations, and use the difference between these 2 values to calculate the globulin concentrations. Albumin is an important colloidal protein that serves as a carrier of other compounds in the blood (ie, calcium) and helps to maintain oncotic pressure. Bromocresol green dye binding is a common method used by biochemistry analyzers for measuring albumin concentrations in the blood of reptiles. However, this method is not without potential complications. Albumin, and protein binding in general, can vary between species based on several factors, such as the actual concentration of albumin and the other globulins. Dye binding itself in reptiles may lead to inaccurate results.<sup>2</sup> In order to determine the potential for misclassification of a biochemical parameter, it is essential to design studies that allow for validation. In the case of albumin, protein electrophoresis can be used for comparison. Ceccarelli and colleagues<sup>3</sup> designed a prospective study utilizing agreement analysis to screen for bias between testing methods. Historically, correlation analysis might be used for these types of studies; however, this type of analysis would be inappropriate. Data

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