

THE USE OF EVIDENCE BASED MEDICINE IN AVIAN AND REPTILE PRACTICE

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*The plural of 'anecdote' is not 'fact'*¹

Avian, and particularly reptile, medicine are relatively new fields of veterinary medicine. As such, the associated learning curves are steep and exponential, and those who practise in these fields display an admirable thirst for new knowledge. This is evidenced by:

- Journals dedicated to these species e.g. *the Journal of Avian Medicine and Surgery*, *the Journal of Herpetological Medicine and Surgery*, and *Veterinary Clinics of North America: Exotic Animal Practice*;
- Textbooks such as *Clinical Avian Medicine and Surgery* and *Medicine and Surgery of Reptiles*;
- Internet discussion forums, such as the Unusual and Exotic Pets Veterinary SIG, Exotic DVM, Birdmed, and VIN;
- Conferences

The advent of the Internet has allowed the free and rapid passage of information between veterinarians around the globe. Unfortunately, the lack of adequately funded scientific research has meant that much of the information disseminated between veterinarians is anecdotal – *see one, do one, teach...* While some of this information is indeed factual and at the cutting edge of veterinary medicine, an equal (or greater) amount is incorrect, misleading and potentially dangerous.

If we are to continue to advance avian and reptile medicine to the highest levels, it is vital that we be able to distinguish between scientifically valid information and unproven anecdotes. This is where Evidence Based Medicine (EBM) comes into play.

What is EBM?

EBM is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients”; it involves the integration of clinical expertise and the systematic research of externally available clinical evidence. At its core is our confidence in scientific methodology enabling us to distinguish between information that is likely to be accurate and that which is likely to be false or unproven.²

When faced with a complicated and challenging case a clinician can choose to work it up using one of two approaches: an educated guess (using pattern recognition, assumptions about disease epidemiology and pathophysiology, consulting colleagues in person or on the 'Net, and browsing journals, conference proceedings and even lay literature); or EBM to systematically and scientifically evaluate the available evidence, thereby eliminating the effects of memory, assumptions, and personal bias.

Some examples where EBM was not – but should have been - used

In last few decades there have been a few 'accepted truths' in avian and reptile medicine that were based on anecdotal evidence, extrapolated from mammalian

medicine, or arose from a misunderstanding of physiology. EBM has disproved these 'truths' in recent years, yet they are still accepted as truths by many clinicians.

Lactulose is often recommended as a treatment for liver disease in parrots, especially in some on-line forums. This recommendation appears to have been extrapolated from mammalian medicine, where the action of lactulose in the intestinal lumen may reduce the amount of ammonia presented to the liver via portal circulation, and reduces the risk of hepatoencephalopathy. Lactulose does not have any direct effect on the liver. The recommendation for the use of lactulose in parrots does not appear to take into account that vegetable proteins have minimal encephalopathic precursors and that hepatoencephalopathy has not been documented in parrots. Yet many treatment recommendations for liver disease in parrots include the use of lactulose, despite the complete lack of peer-reviewed evidence of its efficacy.

It is frequently recommended that reptiles and birds not be injected with drugs in the caudal part of the body, in case the renal portal valve system allows the drug to be excreted rather than entering general circulation. This recommendation ignores that this valve is adrenergic in its response, and that the stress of being handled and injected would open the valve and the drug would enter general circulation before entering the renal circulation. This was borne out by Holz's work (2002).³ Despite this, the recommendation continues to be made in veterinary literature.

Calcium disodium versenate (Ca EDTA), used for treating heavy metal toxicosis, is widely reported to be nephrotoxic and care is urged in its use. This extends to a common recommendation to use it for 3-5 days on, and then 3-5 days off; this cycle is repeated until the patient reaches acceptable blood levels of the toxin in question. Following the literature trail back to the origin of this recommendation, the source appears to be a single paper reporting nephrotoxicosis in a group of lead-affected children treated with Ca EDTA. This paper made no attempt to distinguish between damage caused to the kidneys by the lead or by the drug (Alan Fudge, personal communication). Yet this paper is still the primary source for the treatment recommendation for lead poisoning in many different species – including birds.

Zinc toxicosis is possibly the most over-diagnosed condition in avian medicine today, with almost every conceivable medical condition laid at its door - feather-picking, poor growth, neurological disease, and so on. Much of this 'zinc hysteria' can be attributed to a non-peer reviewed paper presented at an Association of Avian Veterinarians conference, and subsequently repeated in lay literature. This paper ignored much of the known knowledge of the physiology of zinc and its effects as a toxin, and the ongoing 'zinc myth' continues to ignore the many subsequent papers discussing zinc and its toxic effects. One can only speculate how many clients have spent money for zinc testing – and how many patients have needlessly been treated for zinc toxicosis - when EBM suggests this testing is unnecessary.

These are just some of the recommendations made on the Internet and in veterinary literature. The overwhelming feature of these recommendations appears to be their blanket acceptance by much of the veterinary community as being factual, without any attempt at scientific validation. It is the author's opinion that this blanket acceptance is hindering the progression of avian and reptile medicine.

So how do we use EBM?

EBM requires a large body of high quality, patient-centred research that is readily available to veterinarians who are able to access and critically appraise the data.²

One of the biggest hurdles to the widespread use of EBM in veterinary medicine today is the lack of 'methodically performed, rigorous, large-scale studies in veterinary medicine.'² As avian and reptile practitioners, we must recognise that this deficit is particularly glaring in our field. There is a pressing need in our field to compile data from clinical experience and publish it, after subjecting it to peer-review, so that we can expand the available knowledge database. Australian universities have limited funds available – and perhaps limited interest – for conducting large scale trials. This, in effect, throws the burden – the responsibility, if you like – for compiling this data onto the shoulders of private practitioners.

As we expand this database, the next step is for clinicians to use it in their decision-making process. Cockcroft and Holmes (2003)² suggest that the following self-assessment can indicate to a clinician if they are already practising EBM:

- Do I identify and prioritise the problems to be solved (information needs)?
- Do I perform a competent and complete examination to establish the likelihood of alternative diagnoses?
- Do I have an accurate knowledge of disease manifestations, the sign sensitivities and specificities, and the frequency of occurrence of different combinations of clinical signs within a disease(s)?
- Do I search for the missing information?
- Do I appraise the information in terms of scientific validity?
- Do I understand the scientific terms such as sensitivity and specificity, which will enable me to interpret the information provided?
- Do I have the resources to access the Internet?
- Am I aware of the veterinary information databases?
- Am I aware of the veterinary decision support systems that are available?
- Is the application of new information scientifically justified, and intuitively sensible, for this situation?
- Do I explain the pros and cons of the differing opinions, taking into account the different utilities, to the owners?

What do I get out of EBM?

Utilised well, EBM will allow the clinician to reach an accurate diagnosis; to form a well-considered prognosis; to decide on the best treatment plan; and to formulate prevention and control plans. All of these objectives go towards one primary objective – the welfare of our patient.

So what skills do I need to develop to practice EBM?

Many of us feel that we already practice EBM, but the self-assessment questions above may lead you to recognise areas of deficiency that need to be worked on. New skills must be learnt – or perhaps, re-learnt. These include:

- The need to convert information needs into clinical questions that must be answered;

- The identification of sources of information, and learning how to search these for the answers we need;
- Learning how to appraise this information critically and scientifically so as to validate its application to the current problem;
- Using this now-validated information to formulate a diagnosis and treatment plan.

These skills do not come naturally to us, but they are skills we need to develop if we are to take avian and reptile medicine to the next level and beyond.

References

¹ Anon, Veterinary Information Network, 2008

² Cockcroft P, Holmes M (2003) Handbook of Evidence-Based Veterinary Medicine. Blackwell Publishing, Oxford

³ Holz PH, Burger JP, Pasloske K, Baker R, Young S. Effect of injection site on carbenicillin pharmacokinetics in the Carpet Python (*Morelia spilota*). J Herpet Med Surg, 2002; 12(4): 12-16