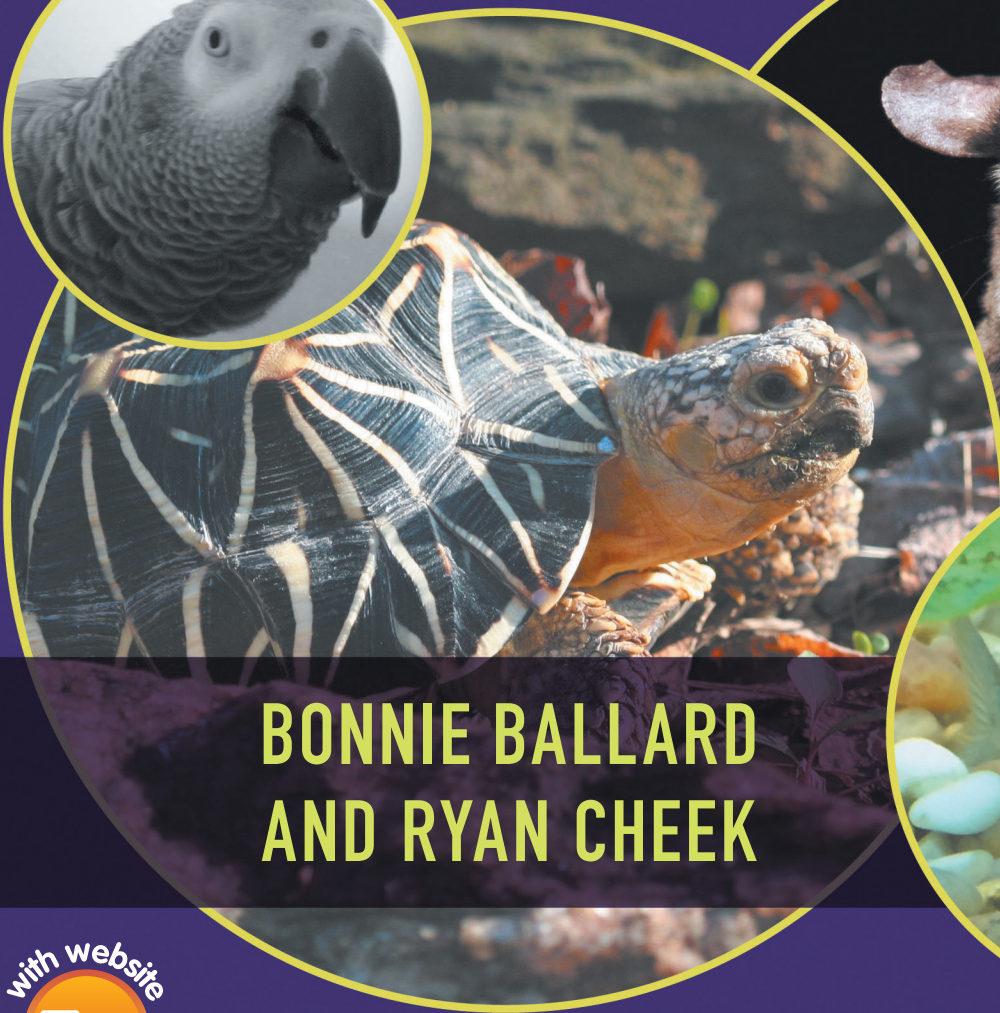


Exotic Animal Medicine

for the Veterinary Technician

T h i r d E d i t i o n



**BONNIE BALLARD
AND RYAN CHEEK**



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Exotic Animal Medicine for the Veterinary Technician

Exotic Animal Medicine for the Veterinary Technician

Edited by

Bonnie Ballard DVM

and

Ryan Cheek RVTg, VTS (ECC)

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Bonnie Ballard

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Ryan Cheek

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Preface

The third edition was written to provide the veterinary technician with important updated information about a variety of species commonly seen in exotic practice reflecting changes in this branch of medicine that have occurred since the second edition. This text would be beneficial to the technician who would like to work with these animals but may have graduated years ago before this area of medicine was popular. This text would also be helpful to the technician who works for a veterinarian who would like to add exotic species to his or her practice. While it was not written for veterinarians, they may find it beneficial as well.

With the help of this book, the technician will know what questions to ask to obtain an adequate history, be able to educate the client about husbandry and nutrition, be able to safely handle and restrain common species, and be able to perform necessary procedures when needed. Because the field of exotic animal medicine is a dynamic one, new knowledge is constantly emerging about many of the species kept as pets, and new information can in some cases contradict what was thought to be true before. For many species, exotic animal medicine could be said to be in its infancy. We realize that for some of the species featured in this book, the information presented may need to be modified in the future. What we know about exotic animal medicine is

forever changing and much has not been scientifically proven, it is common to find contradictory information from one reputable source to the next. This can create frustration but also provide the challenge of working in a cutting edge area of medicine. This is the major reason why attending continuing education in this area of medicine is paramount. Veterinary technicians working in exotic medicine need to engage in lifelong learning to be up to date on the latest information.

New contributors have been added to this edition as well as new chapters. While some of the contributors provided drug dosages and formularies, we do not take responsibility for what is provided. We also realize that while technicians do not make decisions about what drugs to use in any animal, they are required to be familiar with different pharmaceuticals, know where to find a dosage, and know how to calculate it.

This book was written with the assumption that the technician already is educated in topics such as anatomy, physiology, medical terminology, pathology, and pharmacology. Only what is unique to the species featured is presented.

We hope this book proves to be beneficial to all technicians interested in exotic animal medicine.

Bonnie Ballard
Ryan Cheek

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James R. McClearen, DVM

Shannon Richards, CAT

Disclaimer

As exotic animal dosages are based largely on empiric data and not researched facts, the editors and contributors make no guarantee regarding the results obtained from dosages used in this textbook.

About the Companion Website

This book is accompanied by a companion website:

www.wiley.com/go/ballard/exotics

The website includes:

- Supplementary interactive multiple choice, true/false, and short answer questions.
- PowerPoint slides of all figures from the book for downloading.

The password for the site can be found in the following location: last word in the legend for Figure 2.37.

Instructors can also gain access to a companion website with the above materials and answers to the multiple choice questions. To access this site, please go to the book's page on wiley.com and navigate to the Instructor Site; you can then register your information to gain access.

SECTION I

Introduction

CHAPTER 1

Exotic Animals in Clinical Practice

Bonnie Ballard

Welcome to the world of exotic animal medicine! For those who practice it, it is the variety that provides the spice to veterinary life. In a practice that sees exotics, it would not be uncommon to see a dog for vaccines, a diabetic cat, an iguana with pathologic fractures, a ferret for a physical examination, a rabbit with hair loss, and a feather-picking cockatoo all in one day. The challenge for those in this field lies in the vast differences in the species seen (Figure 1.1).

In veterinary medicine, an exotic animal is any animal that isn't the dog, cat, horse, or cow. Exotic animals include wildlife species, animals commonly used in research that are kept as pets, and animals native to various regions of the world, such as South America, Australia, and Africa. The interest in exotic animal medicine continues to grow and this is related to the fact that the number of people who own exotic pets increases year after year. Based on data from an AVMA sourcebook, it is estimated that 10.6% of households in the US own "specialty or exotic pets" or pets other than dogs, cats, birds, or horses (AVMA 2012). With respect to exotic companion mammals, rabbits are most popular, followed by guinea pigs, hamsters, "other rodents," ferrets, and gerbils. It is estimated that roughly 8 million of these animals are owned by US households at year end of 2011 (AVMA 2012). During the same time period it was estimated that more than 5 million households own pet reptiles, with turtles being the most popular followed by lizards and snakes. Households owning birds in the US are estimated to be 3.7 million (AVMA 2012). These statistics are evidence that there is a need for veterinarians and veterinary technicians to provide care for these animals. It should come as no surprise that the client that brings their dog or cat into a small animal hospital has one of the aforementioned pets and would welcome the chance to bring that pet to the hospital if exotic animal medicine was offered.

Many households that own dogs and cats also have an aquarium. In 2008, it was estimated that 15% of US households owned aquarium fish. Of these households, the majority owned freshwater fish. In the US, marine fish are believed to be owned by 600,000 of the over one million people worldwide that keep this type of fish. Fish owners may own many aquariums and some may even breed certain types. Owners rely on other fish enthusiasts, through Internet sites, to learn about fish care because other than a local pet shop there may not be any reliable resources for

information and treatment of their fish. Having a veterinarian being willing to treat fish would be a welcome idea once a client learns that services are available.

Continuing education is an important part of a veterinary technician's professional enhancement, and its importance in exotic medicine cannot be overemphasized. What is known about the care and treatment of exotic animals is forever changing as more and more is learned. What one may have heard is the proper diet for a particular lizard one year may be something different the next year, for example. More and more drugs are being tried in exotics. For example, the use of analgesics is a hot topic in exotic animal medicine as more and more drugs have been tried and shown to be effective. This is largely because veterinary professionals are acknowledging how these species feel pain and because they are no longer treated as expendable pets. This type of cutting-edge information is now frequently presented at conferences and in professional publications. This presents an added challenge to practices that see exotic animals as information is forever changing.

With an increase of exotic pet ownership comes an increase in the amount and variety of continuing education available for veterinary technicians and veterinarians at veterinary conferences. There is also an obvious increase in the amount of people attending seminars related to exotics. For example, at the North American Veterinary Conference in the late 1990s it was common to hold such a session in a small room and the room not be full. Currently the exotic sessions are held in large rooms to accommodate the increasing number of people who are interested in the topics. The amount of continuing education sessions available to technicians has increased as well. In recent years, for example, there has been an increase in the number of continuing education hours related to exotic analgesia, behavior, and enrichment.

The amount of available specialties related to exotic animal medicine has increased. The Association of Exotic Companion Mammals, established in 2000, and the related ABVP Exotic Companion Mammal Specialty have been created to meet the needs of those who seek more education in these animals. This specialty, the newest related to exotics, had its first diplomats in 2010. Similarly, there is the Association of Reptile and Amphibian Veterinarians established in 1992 and



Figure 1.1 A technician drawing blood from a skunk. (Photo courtesy of Ryan Cheek, RVT.)

the related ABVP Reptile and Amphibian specialty was established in 2009. Because of the increase in interest in exotics evidenced by the new associations, more opportunities for technicians to expand their knowledge base now exist. Additionally, all of the exotic associations mentioned above allow technicians to become members.

There are now two veterinary technician specialties available for those interested in exotics. The Academy of Veterinary Zoological Medical Technicians provides an avenue for becoming credentialed in zoo animal medicine (Table 1.1). The newest exotic specialty can be obtained through the Academy of Veterinary Technicians in Clinical Practice (Table 1.2). This academy has a concentration in avian and exotic medicine.

This increased interest in exotic animal medicine by veterinarians is a win-win for technicians as there are now more opportunities for work with exotics (Figure 1.2). While there has not been an explosion in exotic-only practices, many practices have expanded their scope of practice to include more species. For example, a clinic that may have only seen rabbits in the past may expand the number of species they are willing to see to include all of the exotic companion mammals. For technicians who enjoy working with birds, it still remains difficult to find a

Table 1.1 Requirements and application process to become a VTS (Zoo)

1. Be a credentialed veterinary technician in your state of practice
2. Obtain 10,000 hours of clinical experience within the field of exotic animals within 7 years prior to application
3. Obtain 40 hours of CE related to exotic animals within 5 years of application
4. Case log comprising of a minimum of 40 cases within 3 years of application
5. Completion of mastery of skills list
6. Write five case reports
7. Two letters of recommendation
8. Submit application by deadline
9. Sit for examination

For the most current application packet and information visit www.avzmt.org. CE, continuing education.

Table 1.2 Requirements and application process to become a VTS (Exotic Companion Animal)

1. Be a credentialed veterinary technician in your state of practice
2. Obtain 10,000 hours of clinical experience within the field of exotic animals within 10 years prior to application
3. Obtain 40 hours of CE related to exotic animals within 5 years of application
4. Case log comprising of a minimum of 50 cases in the calendar year of the application
5. Completion of mastery of skills list
6. Write four case reports
7. One letter of recommendation
8. Submit application by deadline
9. Sit for examination

For the most current application packet and information visit www.avtcp.org. CE, continuing education.

practice that sees them for anything more than a beak, nail, or wing trim. The Association of Avian Veterinarians, established in 1980, has roughly 1,400 practitioners and only 10% see birds exclusively (Nolen 2013).

There are several scenarios in which a technician interested in exotics may find this book helpful. A technician might take a job in a practice where exotics are seen but knows little about them because graduation happened before exotics became as popular as they are now. This book will help that person get up to speed with what he or she needs to know about popular exotic species. A technician may work for a veterinarian who wants to add exotics to the practice but doesn't have hands-on experience with them. Alternatively, a technician may find employment working with a wildlife rehabilitator and needs to brush up on current information about exotics. Knowledge of exotic animals, their treatment, and their care is desirable when pursuing employment in the zoo and public aquarium environment.

For a technician who works for a veterinarian who would like to add exotics to the practice, the technician can play a key role in helping to establish it. It is essential that the technician help the veterinarian understand how the practice will need to change to accommodate these species. A veterinarian must accept the fact that a 15- or 20- minute appointment will not suffice. In many cases appointments of 30 minutes or longer will be required. Because husbandry and nutrition are typically the two most common causes of illness in exotic animals, a thorough history in these areas is essential. Also, because of the delicate nature of some of the species seen, more time may be required to perform a physical examination. In many cases the owner will require client education to keep his or her pet healthy, so adequate time to do so will be required.

Because one may have a very limited time to perform a physical examination or perform a procedure, it is the technician's job to make sure that all supplies and instruments needed for the examination and/or treatment be ready prior to handling the animal. With many patients, time is of the essence.

Anesthesia for exotic patients poses a huge change from small animal medicine in that a veterinary technician who is



Figure 1.2 An exclusively exotic animal medicine practice near Savannah, Georgia. This practice sees all types of exotic animals including reptiles, birds, exotic companion mammals, amphibians and fish. (Photo courtesy of Dr. Stacey Leonatti Wilkinson.)

experienced with exotics will be required to monitor anesthesia on ALL patients for ALL procedures. These patients require second-to-second monitoring. This is especially true for avian patients (Figure 1.3).

A veterinary technician who has an interest in exotic animal medicine will be expected to be a trusted expert in restraint



Figure 1.3 A veterinary technician intubating a cockatoo. (Photo courtesy of Ashley Schuller, RVT.)

techniques, which can vary from species to species. Different types of lizard require different restraint techniques, for example. Proper restraint ensures the safety of the veterinary staff and the patient whether that be a cockatoo or a chinchilla.

The front office staff must be knowledgeable and interested in exotic pets as they will be the first people the exotic pet owner comes in contact with. The worst thing that can happen is for a snake owner, for example, to come to the front desk and the receptionist recoil in fear at the sight of it. This is not only unprofessional behavior but one that puts the knowledge of the doctors into question. Likewise, if a receptionist does not know the difference between a macaw and a cockatoo, the bird owner may question the knowledge of the doctors as it may appear that the clinic doesn't see many birds!

Another consideration when deciding to see exotic pets is where they are going to be housed in the hospital. Because many of the exotic companion mammals seen are prey animals, where they are housed in relation to dogs and cats must be taken into account. For example, a rabbit should not be caged where a cat patient can watch it. This alone can create undue added stress for a rabbit patient, who is already stressed being in the hospital environment. An exotic pet should not have to add the fear of being eaten to its worries during a hospital stay!

One of the most important roles of the veterinary technician is that of a meticulous history taker. As each chapter illustrates, a simple history will not do. It is not uncommon for a practice that sees exotics to have a separate history form from those used for dogs and cats. For example, the practice may have a history sheet for reptiles, another for exotic companion mammals as well as

one for avian patients. By having history forms such as these it not only ensures that all necessary questions are asked, but it also saves time. Wild-caught species can have different health problems than captive-raised ones so the origin of the pet needs to be ascertained. How the pet is housed is vitally important, and this means not only asking what it is housed in but the cage size, construction, substrate used, and where it is kept in the home. If the animal is not brought in the cage it is housed in, the technician, after gathering the history, should be able to create a mental picture of what the cage at home looks like. In a world in which most people carry a phone that has a camera it would be possible to have the receptionist who schedules the appointment to ask the owner to take a picture of the cage prior to their visit to the practice.

The same is true for gathering adequate information about the pet's diet. It is not good enough to ask what is fed as what is fed may not be what is consumed. For example, an owner may report that his or her Amazon parrot's daily diet is made up of fruits, vegetables, and seeds. When asked how much of each is consumed each day, the answer may be mostly seeds, which is an inadequate diet. For the practice that sees reptiles that are insectivores, a veterinary technician must be knowledgeable about what insects are safe and nutritious to feed and which are not. Questions about diets are appropriate when obtaining a history about fish as well.

In many cases, owners of exotics may have gained misinformation about their pet's care from the pet shop where it was purchased. While some may be knowledgeable, many pet shop employees simply do not know the correct information about the species they sell. The veterinary technician should be able to give owners the correct information about husbandry and nutrition without chastising them for their mistakes. Many honestly may not know that what they were doing was wrong. Owners may have obtained books that are not written by reputable sources or found information on the Internet that is inaccurate. In a clinic that sees fish the veterinary technician can offer advice on how to set up a tank and avoid common pitfalls that happen to new fish owners, such as buying too many fish for a brand-new tank, or not quarantining new additions. Owners value information on how to keep their pets healthy and their veterinary clinic should be the source of that information.

The technician can also be of value when helping a client make a decision about what type of exotic pet to buy. For example, an iguana is considered to be a difficult reptile to keep as its housing and nutrition requirements are demanding. A bearded dragon may be a better choice. A parakeet may be a better choice for a first-time bird owner than a macaw, which can be noisy and messy as well as requiring a lot of behavioral enrichment. Also a macaw would require a larger cage than a parakeet so size of the client's home may factor into the decision. The size of a client's home can be a consideration with certain reptiles as well.

The topic of conservation of species is also important. New exotic pet owners should be encouraged to acquire captive-raised species rather than wild-caught if possible. With many exotic species, numbers in the wild are diminishing. Captive-raised species can also be a benefit as they may have less disease

and behavioral problems. For example, wild-caught snakes typically have more parasites than captive-raised specimens. Most exotic species desired as pets can be obtained from captive raised sources. With regard to fish, the technician should educate a client about the differences in care between a freshwater and salt-water tank and what types of fish can be housed together.

The veterinary technician can also provide the veterinarian who wants to add exotics to the practice ideas on how to market this change. It is easy for a clinic to advertise this addition by putting a sign up at the reception desk, mention it on the clinic website and on social media sites. If a clinic produces a periodic newsletter the technician can add an item related to exotics. A simple low-cost service to offer to fish-owning clients is water testing. By using a professional water testing kit rather than one found in a pet shop, clients can see the value in what they are paying for. If a veterinarian wants to add fish to the practice, offering house calls to evaluate fish in their environment can be offered. The veterinary technician can do water testing and obtain a history while the veterinarian evaluates the fish. With the help of good marketing, the practice soon can become the go-to resource for their clients and the community for information that a person is seeking about the ins and outs of keeping and caring for exotic animals as pets.

Offering services for exotic patients does not require a large amount of money. While the average animal hospital will have most of the necessary equipment needed to treat exotics, there are some items that will need to be purchased. For example, a gram scale will be required to weigh many of the very small patients. Microtainer blood collection tubes are also essential. For the veterinarian who desires to see fish, the good news is that it doesn't require a huge expenditure to add them. Much of the equipment and supplies necessary to treat fish are items that a clinic already has. And those supplies that need to be purchased do not involve huge amounts of money. Appendix 12 provides a list of equipment useful in exotic practices.

One should never underestimate the strength of the human-animal bond that exists between owners and their exotic pets. An owner can be as bonded to a mouse or a snake as another owner would be to a dog or horse. Just as one should never assume what an owner is willing to spend for medical care on dogs, cats, and horses, one should never assume what exotic pet owners would be willing to spend for their pets. The low cost of some exotic companion mammals does not mean that owners will not seek quality veterinary care. It is not uncommon to see a devoted owner spend hundreds of dollars for a surgical procedure for a pet rat. For those that keep fish, they can range in cost from around \$3 for a fancy guppy to \$100 or more for some marine species (Noga 2010). There are fish that can cost several thousands of dollars. Fish owners can and do become very attached to their fish and may even have names for them. These owners will be willing to spend money to treat them and to learn how to properly care for them.

Practices seeing exotic pets must be aware of and provide current standards of care as these have advanced in exotic animal medicine. For example, during anesthesia, monitoring devices used in dogs and cats can and should be used, such as pulse

oximetry and ECGs. Providing analgesia is an important consideration as well. Multimodal techniques as well as regional nerve blocks for example are used in exotic animals including reptiles.

Some veterinary practices that see exotic pets will see primates and venomous species. Because of the dangers to humans from these animals, veterinarians will typically set the “rules of engagement” regarding the care and treatment of these animals. For example, the veterinarian may only see a primate or a venomous snake after hours, when all other employees and clients have left the premises. Likewise a veterinarian may require that an owner of a venomous snake provide in-date antivenin along with the snake.

Some veterinarians will not see large exotic cats in practice due to safety concerns. And yes, there are people who have permits to keep them! Others will see these animals on the owner’s premises as long as handling equipment, such as a squeeze cage, is provided. It will be important that all employees know the clinic’s protocol for seeing primates, venomous species, and large cats.

Every state has different laws regarding which species are legal to keep as pets and which are not and changes in these laws happen frequently. It is up to the practice to be apprised of the current laws involving ownership of exotic animals in the

municipality and state in which the clinic is located. It is up to the veterinarian to decide whether he or she will see pets that may in fact be illegal pets, and to communicate this information to the technicians and other staff.

Because many veterinary technicians who work with exotics have an interest in working in a zoo or aquarium, included are two chapters devoted to explaining the technician’s role in those environments.

In response to the increasing interest in exotics, this book provides a compilation of the most recent practices in the area of exotic animal care. Exotic animal medicine provides a veterinary technician with the opportunity to utilize all of his or her skills and knowledge in a way that has a direct benefit to the practice and the patients. Enjoy!

References

- AVMA. 2012. U.S. Pet Ownership & Demographics Sourcebook. American Veterinary Medical Association.
- Noga E. 2010. Fish Disease: Diagnosis and Treatment. Ames, IA: Wiley-Blackwell.
- Nolen RS. 2013. Birds of a feather. JAVMAnews, September 15.

