

## **SMALL MAMMALS – HOW TO GET STARTED!**

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### **INTRODUCTION**

Incorporating small mammal patients, such as rabbits and rodents into your career and practice can be rewarding yet potentially challenging. Small mammal medicine is poorly represented in the veterinary curriculums. Therefore, most veterinarians wanting to gain basic competence and confidence in small mammal medicine need to seek opportunities and gain knowledge through self-directed study or formal continuing education events. However, other factors besides the clinician's competence are important to consider before building your small mammal caseload.

### **FINANCIAL CONSIDERATIONS**

Compared to dog and cat patients, appointments for small mammal patients may take up more time and often require a veterinary technician for restraint or even sedation or anesthesia (e.g. hedgehogs), to complete a physical exam. In addition, routine diagnostics such as fecal parasitology screenings and heartworm testing are not performed in most small mammals, and routine blood work may not be recommended due to the small size of the patient or due to the difficulty of obtaining blood. All these factors result in generally lower average revenue generated for small mammal appointments, in particular for smaller species. Furthermore, unlike dogs and cats, small mammals, except rabbits and ferrets, do not get routine vaccinations, and owners do not need to purchase preventative anti-parasite medications, further reducing the revenue earned per small mammal appointment. Compared to dog and cat appointments, this can lead to a significant negative financial impact if small mammal appointments are booked instead of dog or cat appointments. Therefore, the appointment fee charged for small mammal appointments should be carefully considered. In addition, clinics may want to limit the number of small mammal appointments they book per day to avoid negatively impacting the clinic's finances.

### **BECOME FAMILIAR WITH SMALL MAMMALS AS PETS AND AS PATIENTS**

Most veterinarians are willing or interested in seeing small mammals as patients usually have an affinity for these species and some basic knowledge about small mammal behavior and husbandry. If this is not the case, consider getting small mammals as pets or clinic animals to gain more experience with basic husbandry, behavior, and handling. It goes a long way to know how to take care of a small mammal as a pet if you want to talk confidentially to small mammal owners. Having small mammal species as clinic pets will also make your support staff more comfortable and knowledgeable about these species, and it signals your clients that your clinic

has a sincere interest in seeing these species as patients. In addition, you and your staff should be familiar with and able to recognize common small mammal species and provide sound husbandry advice to owners.

Veterinarians interested in treating small mammals need to make an active effort to gain the basic knowledge and clinical skills needed to manage this species safely and effectively. This will require much self-motivation to read the available textbooks and online sources, attend continuing education events, and attempt to shadow more experienced avian veterinarians. Becoming a member of the Association of Exotic Mammal Veterinarians (AEMV) is recommended, as it provides access to many educational material online and continuing education events (virtual and in-person) and includes a subscription to the Journal of Exotic Pet Medicine. In addition, many national or regional conference providers have dedicated small mammal tracks and wet labs.

However, shadowing a more experienced small mammal veterinarian is also beneficial in gaining experience and seeing how the veterinary team works with small mammal patients. Building relationships with more experienced veterinarians and asking for mentorship will allow you to discuss more complex cases and ask for advice when needed. In addition, having the option to refer to a difficult case is helpful.

## **HAVE SMALL MAMMAL COMPETENT SUPPORT STAFF**

As veterinarians, we heavily rely on our support staff, including receptionists, veterinary technicians, and veterinary assistants, to provide care to our patients and services to our clients. Therefore, it is important that the entire team is interested in small mammal patients and gives new clients willing to bring their companion small mammal to your clinic the sense that your clinic is competent in dealing with their pets. Since frequently not all team members may be equally interested or suitable in working with your small mammal patients, you should have dedicated technicians with a sincere interest and experience in dealing with these species. For the restraint of most small mammals, a competent and experienced technician is critical to allow you to perform complete physical exams and obtain diagnostic samples safely and effectively. Procedural sedation may be required for some species even to complete a physical exam (e.g. hedgehogs, hamsters, sugar gliders). For blood collection or diagnostic imaging, sedation or anesthesia is required in most small mammal species. In rabbits, blood can be collected without sedation. Procedural sedation makes these tasks significantly easier and safer and allows one to obtain more diagnostic test results (e.g. properly positioned radiographs). To give your staff and yourself more opportunities to gain competence with small mammal species, consider working with different small mammal rescue organizations in your area or organizing handling labs in your clinic to provide your team the opportunity to learn. Becoming confident in handling and restraining small mammals is critical for veterinarians too, and these tasks should not be exclusively delegated to veterinary technicians.

Your veterinary technicians also play a critical role in the education of your small mammal clients. Therefore, they should be knowledgeable about small mammal husbandry. Since behavioral, nutritional, and reproductive problems are common in small mammals, your staff needs to be able to provide the correct information to clients. Having educational handouts available for your clients is also an efficient way of delivering and reinforcing information about husbandry, behavior, and common diseases.

## **EQUIPMENT**

Small mammal patients, particularly small rodents, require specialized equipment not routinely found in clinics that see dogs and cats. Having gram scales with a transparent container is essential to obtain body weights in small patients accurately. Small syringes and needles are needed to obtain blood samples and administer medications and subcutaneous fluids. An incubator or other climate controller environment is essential to house patients or recover them from anesthesia and surgery. Nutritional support in small mammals is usually provided by syringe feeding a variety of critical care formulas, which should be stocked in the clinic at all times. In addition, commercial pelleted diets, different types of hay and treats food and water dishes, suitable cages, and hide boxes should be available to hospitalize small mammals. For small mammal anesthesia, small face masks, induction chambers, small endotracheal tubes, supraglottic airway devices for rabbits, non-rebreathing circuits, and appropriate anesthetic monitoring equipment should be available. For small mammal soft tissue surgery, delicate standard instruments are often suitable. However, for small patients, microsurgical instrumentation would be necessary.

## **BE ABLE TO OBTAIN AND INTERPRET BASIC DIAGNOSTIC TESTS**

To successfully manage small mammal patients, veterinarians, and veterinary technicians need to be able to obtain blood samples safely and effectively obtain radiographs, amongst other clinical techniques.

## **BLOOD COLLECTION**

Blood collection and evaluation of a complete blood count and biochemistry profile are the most frequently performed diagnostic tests in small mammals. Therefore, safe restraint and blood collection, as well as the correct handling and processing of the obtained blood samples, are critically important. Being able to interpret CBC and biochemistry values in birds and choosing the appropriate additional tests is essential. Biochemistry should always be performed in-house for ill small mammal patients since rapid diagnosis and initiation of the appropriate treatment is critically important to optimize case outcomes.

In rabbits and ferrets, blood can usually be collected consistently in all patients, but sedation may be required based on the patient's temperament and availability or skilled support staff able to restrain the patient safely. In rabbits, the lateral saphenous veins are the preferred site for diagnostic blood collection, while the jugular veins are usually reserved for the collection of larger blood volumes (e.g. for blood transfusions) in sedated rabbits. In ferrets, the cranial vena cava is the most commonly used blood collection site, which carries minimal risks for complications due to the caudal location of the heart in this species. In ferrets, blood should not be collected under isoflurane anesthesia, since the PCV will be artificially reduced, due to suspected red blood cell sequestration in the spleen.

In rodents, hedgehogs, and sugar gliders sedation or anesthesia is usually required to obtain a diagnostic blood sample, unless the patient is weakened enough that it does not resist restraint. In guinea pigs blood collection can be attempted without sedation from the jugular veins or if

only small volumes are needed (< 0.2 ml) from the cephalic or saphenous veins. In chinchillas, blood can be collected in awake animals from the jugular veins in many cases, and the use of the 28G needle attached to a 0.5-1 ml insulin syringe will increase the chance of obtaining a diagnostic blood sample.

The subgingival vein located below the gingival margin of the lower incisors can be used in most rodent species but works particularly well in rats and hamsters. Anesthesia or deep sedation is required for these techniques. The internal jugular veins can be used for blood collection in most rodent species as well as hedgehogs and allow for collection of sufficiently large blood samples. The femoral veins can be used for blood collection in all mammal species and the tail vein can be used in rats.

## **DIAGNOSTIC IMAGING**

Obtaining diagnostic radiographs in small mammals is another important skill for the veterinary team to master. Sedation or anesthesia is usually required to obtain diagnostic radiographs safely for the patient and the veterinary team. Obtaining adequately positioned radiographs without any rotational or superimposition artifacts is essential, as otherwise, the obtained radiographs are usually of significantly reduced diagnostic value or non-diagnostic. Becoming familiar with the interpretation of small mammal radiographs is essential and having the ability to submit radiographs for review by specialists is recommended.

Radiographs are the recommended initial diagnostic imaging technique for skeletal, thoracic, and abdominal disorders. For disorders of the skull (e.g. nasal or dental disease) skull radiographs are in most cases not helpful due to the superimposition and rotational artifacts, even if several views are obtained. Therefore, computed tomography is recommended for imaging of the skull whenever possible.

Ultrasound of the abdomen and thorax is frequently indicated to better visualize soft tissue opacities and to obtain samples for cytology and culture.

## **FURTHER READING**

Quesenberry KE, Orcutt C, Mans C, and Carpenter JW (eds). *In Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery* (4<sup>th</sup> ed). Saunders Elsevier, St. Louis, MO, 2020,