

## CRITICAL CARE MANAGEMENT OF EXOTIC SMALL MAMMALS

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### THE EXOTIC SMALL MAMMAL EMERGENCY

Exotic small mammals (previously referred to as pocket pets) can present to the clinic for a variety of different emergency situations. Although rabbits, rodents, and ferrets are not little dogs and cats, they under many circumstances are treated in a similar manner when it comes to basic stabilization and life saving techniques.

### SPECIAL NEEDS FOR THE EXOTIC SMALL MAMMAL PATIENT

In general, basic equipment used for dogs and cats can be used on many rabbits, rodents, and ferrets. Most exotic small mammals tend to be very little; therefore, pediatric equipment is a must. For example, the heart rate of many exotic small mammals can easily be over 350 beats per minute. In many species, this would be considered tachycardic, but for many of the exotic small mammals, this would be considered normal. It is difficult to find machines such as an echocardiograph (ECG), pulse oximeter, or digital blood pressure monitor that measure values high enough to produce accurate readings in exotic small mammals. I have found one ECG manufactured by a company called Digicare that reads up to 999 beats per minute and seems to work well with small exotic mammals.

It is also important to consider how exotic small mammals will be safely housed in the clinic. In some cases, the average metal small dog or cat hospital cage will not be adequate. Species such as rats, hamsters, mice, and ferrets can easily maneuver their way through the cage door front and either get out completely or become stuck or injured. If these cages are going to be used, a plastic cage front that screws onto the metal cage door can be constructed. Plastic cage fronts work great to not only keep the little animals in, but also the heat. Incubators that can provide both heat and oxygen are also essential if exotic small mammals are going to be dealt with in the clinic. There are many commercial incubators available. Keep in mind that if equipment such as an incubator will work for a kitten or small puppy, then it will probably also work for most exotic small mammals.

### WHAT CONSTITUTES AN EMERGENCY?

As with dogs and cats, there are many different types of emergencies for which an exotic small mammal such as a rabbit, rodent or ferret may present. An emergency can be broken into two different categories, "acute" and "chronic." An "acute" emergency is one that has happened suddenly such as trauma (e.g., lacerations, fractures, hit by car, fresh bite wounds). A "chronic" emergency is a disease process that has been on going

in the patient and the client may have just now noticed or the client has been hesitant to have the animal seen. An example of a "chronic" emergency is something like dental disease or vitamin C deficiency in guinea pigs. Whether dealing with an acute or chronic emergency, both are equally dangerous and should be taken seriously.

### DEALING WITH THE EXOTIC SMALL MAMMAL EMERGENCY

It is important for the clinic to have a designated crash cart that includes any emergency equipment that may be needed during a critical situation. The crash cart can be as simple as a tool box on wheels or can be a manufactured commercial cart. The crash cart should be placed in an easy to reach site near an oxygen outlet, light, and exam table. The cart should include specific items such as emergency drugs, various intravenous fluids and catheters, bandage material, endotracheal tubes, an Ambu bag, stethoscope, and any other items that may be necessary when dealing with a critical patient.

When a patient is brought into the clinic, the animal should first be assessed and then dealt with accordingly. The basic ABC's of emergency medicine are used with rabbits, rodents, and ferrets. Unfortunately, many exotic small mammals (except ferrets) can be difficult or near impossible to intubate (especially when the animal is not breathing). It is important to have pediatric endotracheal tubes available as most of the small mammals will use a size 3.5 mm tube or smaller. Even though intubation may be impossible in many situations, it is still attempted. After the patient is intubated, oxygen will be given and manual breathing is provided if needed. The number of breaths per minute will depend on the species of exotic small mammal you are working with. Once breathing is provided, circulation is worked on. This will include giving chest compressions as well as placing an intravenous or intraosseous catheter and starting fluid therapy. (In some situations, intubation and catheter placement can take place at the same time if you have enough staffing.) Emergency drugs such as epinephrine, atropine, glycopyrrolate, and doxapram should be available and ready to use at anytime during a critical situation. When possible, it is helpful to have everything pre-drawn prior to the animal presenting to the clinic. A cheat chart can be hung on the wall for quick reference or a spread sheet program can be created. Spread-sheets are helpful as one can be created for each major group of animals commonly seen in your practice (chinchillas, rabbits, rats, etc.). The spreadsheet should remain simple and contain the common drugs used during emergency situations. Spreadsheet programs are nice because they can be used over and over again. By just inputting the patient's weight, the program will calculate the proper drug doses for you.

Emergency situations can be very stressful. It is therefore important to have specific people designated to perform the tasks at hand. This should be preplanned prior to ever working on an emergency that day. There

are a few options to choose from and the clinic should pick what is appropriate for them. Everyone should be trained in all aspects of emergency care and should rotate their specific jobs frequently (i.e., once per week or month). After any emergency situation, it is a good idea for everyone to talk about how things went and discuss what may or may not be helpful in the future. It is also important to discuss what, if anything could have been done differently. Although it is difficult, try to remain positive. Do not ever point fingers, even if things did not go according to plan. If there are specific concerns about a person's performance, they should not be discussed in front of the group, rather privately at a more appropriate time.

### **ASSESSING DEHYDRATION**

The hydration status of the patient should be evaluated during the physical examination. This is done similarly to a dog or cat. The mucous membranes should be moist and pink. As with most other mammals, the capillary refill time should be between 1 and 2 seconds. A common sign of dehydration in exotic small mammals is dry or tacky mucous membranes. Another sign of dehydration is sunken eyes and lack of skin turgor (skin elasticity). The skin should be tented or pulled upward to assess dehydration. The skin can be gently pinched between the thumb and index finger and tented upright. Once the skin is tented, it should be released and the amount of time it takes for it to return to the original position should be noted. A hydrated animal's skin will return to the original position almost immediately, whereas a dehydrated animal will have a much slower return. Generally the longer the skin takes to return to normal, the more dehydrated the animal is.

If the animal is found to be dehydrated, fluid therapy should be considered and a percentage of dehydration should be estimated for the animal. Accurately estimating the percentage of dehydration is based upon the skin turgor and tenting as well as examining the eyes and mucous membranes. Fluid therapy routes in small mammals include oral, subcutaneous, intravenous (IV), and intraosseous (IO) (IV and IO fluid therapy can be difficult in some very small exotic small mammals) administration. Vessels used for IV catheterization include the cephalic and lateral saphenous veins in most small mammals although due to the size of the vessels, they can be difficult to place in some of the very small critters. In rabbits the auricular vein can be used, but the cephalic and lateral saphenous should be attempted first. The cephalic and lateral saphenous veins can also be used in ferrets, guinea pigs, and chinchillas. In rats, the lateral tail veins can be used to place an IV catheter as well as the cephalic and lateral saphenous veins. If IV access is not possible due to poor perfusion, an IO catheter can be placed. It is best to use a spinal needle when possible because there is a lesser chance of the lumen getting clogged with a bone core when being placed. A regular hypodermic needle can be used when needed. The IO catheter is usually placed in the proximal femur or tibial crest. Either colloid or crystalloid

fluids can be used and should be chosen based on the patient's condition and biological needs.

### **BLOOD TRANSFUSIONS**

Most exotic small mammals weigh anywhere from 30 grams to 4.5 kilograms; therefore, keeping tabs on blood loss is crucial. It becomes a concern if a patient loses more than 10% of their blood volume. For a 1.0 kg patient, this is only 10 mL. Blood transfusions can be given when necessary. A general rule of thumb is to consider transfusing when the animal's packed cell volume (PCV) is between 15% and 20%. The limiting factors include vascular access and obtaining a safe blood product. Artificial blood products can be given to many exotic small mammals, but it does not come without potential risk as there have not been a lot of studies showing which products are safe or effective. A current exotic animal formulary should be consulted before giving any artificial blood product. Whole blood can also be given for transfusion. A donor of the same species is needed to obtain fresh whole blood. The donor animal should be deemed healthy by performing a complete physical examination and running a complete blood count (CBC) and biochemistry panel. If there is only a limited amount of blood, the CBC should be chosen over the biochemistry panel. Blood drawn from the donor should be collected in a syringe containing the anticoagulant citrate-phosphate-dextrose-adenine (CPDA). The dilution will depend on the species being worked with. Cross-matching the donor to the recipient should be performed when possible. This will help reduce the risk of the recipient cross-reacting with the donor's blood once it has been given. It is important to always use a blood filter when performing a blood transfusion on any patient. The animal should be observed for signs of a reaction to the transfusion. The heart rate, respiratory rate, blood pressure, and temperature should be checked at least every 15 minutes during and for at least an hour after the transfusion has been given. If a reaction occurs, the same techniques used with dogs and cats can be used with exotic small mammals.

### **THE STABILIZED PATIENT**

If the animal is able to be stabilized, a physical examination should be performed. For information on how to perform a complete physical examination, please refer to the previous article in these proceedings on physical examination and blood sample collection in exotic small mammals. Upon completion of the physical examination, diagnostics should be taken if possible. Based upon the physical examination findings, diagnostics, such as a fecal, blood work, and radiographs, should be obtained if necessary. Please refer to the previous article in these proceedings for the proper venipuncture sites in rabbits, rodents, and ferrets.

Many exotic small mammals are very sensitive to pain. Whether the patient is dealing with a fractured limb or dental disease, it should always be monitored for any signs of pain. Signs of pain may include vocalizations,

shaking, anorexia and a hunched abdominal cavity to name a few. When this is observed pain management should be considered. Common drugs used for pain management include, butorphanol, buprenorphine, full mu opioids (ferrets only), and nonsteroidal anti-inflammatory drugs (NSAIDs) such as meloxicam.

One of the most important stabilizing and life saving protocols used with exotic small mammals is fluid therapy, force feeding, and pain management. Fluid therapy is important in all exotic small mammals, but especially in the herbivores (rabbits, chinchillas, and guinea pigs). The herbivores need to obtain adequate amounts of fluids to help keep their gastrointestinal (GI) tract hydrated and moving normally. Force feeding is also very important for the same reasons mentioned above. Pain management is equally important because a painful animal will not eat. This is a problem for both the herbivores and the ferrets. The herbivores need to graze frequently to keep the GI tract functioning normally. Ferrets need to eat frequently as their GI transit time is very fast and they can become hypoglycemic easily. Hand or syringe feeding is an essential skill to conquer when working with exotic small mammals. It is very important to keep the GI tract moving in a normal fashion. There are several different hand feeding formulas that can be offered to rabbits, rodents, and ferrets. Herbivorous animals such as rabbits, chinchillas, and guinea pigs can be hand or syringe fed formulas such as blended pellets, vegetable baby food, canned pumpkin, or the commercial diet Oxbow Critical Care for Herbivores. For example, a homemade formula may consist of canned pumpkin mixed with garden vegetable baby food or blended pellets. Homemade formulas such as the one mentioned above are perfectly acceptable to feed as long as they are high in fiber, low in sugar, and otherwise meet the nutritional needs of the patient. Oxbow Critical Care for Herbivores can also be used to hand or syringe feed the patient. Oxbow Critical Care is manufactured commercially and consists of a balanced diet that can be used to provide nutritional support to convalescing herbivores. There are two techniques that can be used to syringe feed herbivorous patients. The

first technique consists of loading a 60-mL catheter tip syringe and simply feeding the animal by placing the tip of the syringe into the patient's mouth. This technique works well with patients that are actively interested in eating. Some patients will actually lick the food from the syringe as it is pushed out. The other technique also consists of loading a 60-mL catheter tip syringe with the hand feeding formula but instead of feeding the patient directly with the 60-mL syringe, several 1 mL or 3 mL syringes will be back-loaded from the 60-mL syringe. The smaller syringes can be placed directly into the patient's mouth with the entire amount of the food in the syringe squeezed into the mouth at one time. This seems really drawn out and tedious (and it really can be!) but for most patients, this technique works the best. If the animal is only fed one small syringe of food at a time, more food actually ends up in the patient and less on the patient, technician, and exam table. In extreme cases, the animal can be tube fed or in some species of small mammals such as rabbits, a nasogastric tube can be placed.

Rodents such as mice, rats, and hamsters can also be syringe fed when needed. Due to their size, a regular Luer tip 1-mL or 3-mL syringe is generally used. The most common type of food used for syringe feeding includes vegetable baby food such as squash, sweet potato and other various vegetable based baby foods. If the patient is being uncooperative, a metal feeding tube (usually used in birds) can be placed into the mouth, but not down into the esophagus. The feeding tube (attached to the syringe) works well to help deliver the food by slowly dripping it into the mouth.

Ferrets can also be hand or syringe fed when needed. A 1- or 3-mL syringe is generally used. There are several different diets ranging from commercial canned diets used in dogs and cats to meat based baby foods that can be offered. Oxbow Carnivore Care can also be used for syringe or hand feeding. The diet preference will depend on the clinic and the ferret. Ferrets are generally good about being hand fed, but the metal feeding tube technique described above can also be used when necessary.