Critical care for exotics

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Lesa Thompson discusses basic principles of treatment, noting the differences in care and the difficulty that comes with a vast array of species presented

EXOTIC pets are treated frequently by veterinary surgeons, and their owners expect a similar level of care as owners of other species. This includes treatment of animals in critical condition due to sudden onset illness, but also animals that have become chronically debilitated, requiring intensive care.

Differences

When considering exotic pets, the veterinary clinician is faced with an array of species. Each taxonomic group has specific anatomical, physiological and behavioural characteristics that will affect how animals should be dealt with in the clinic.

Like kittens and puppies, small species lose heat rapidly due to their large surface area to volume ratio. They should be provided with supplemental heating to prevent unnecessary use of energy for thermoregulation. Small species often require nutritional support to avoid hypoglycaemia.

The general practitioner will probably feel much more confident in dealing with small furries than other groups of exotic pets, due to their similarities with dogs and cats. However, these small mammals have some peculiarities. Most rabbits and many rats possess atropinesterase so glycopyrrolate should be used in place of atropine. Most exotic mammals seen in practice are prey species – such as rabbits and hamsters – and will suffer adversely if stressed by exposure to loud noises or predator species, including dogs, cats, ferrets and birds of prey. Resultant stress will slow
recovery from illness.

Birds will conceal signs of illness until in the advanced stages, so any bird exhibiting clinical signs is very unwell. Birds have high metabolic rates and can rapidly become debilitated when ill or malnourished. They also are highly susceptible to stress during restraint and care should be taken to avoid restricting breathing or causing overheating – particularly in dyspnoeic patients. Birds have air sacs extending from their lungs that can be cannulated to provide oxygen if the upper airway is obstructed.

Reptiles have evolutionary similarities to birds, but their metabolic rate is at the opposite extreme, with slow rates resulting in slow onset of disease and prolonged recovery times. Owners should be primed for a recovery that may take weeks or months. In reptiles, an increase in respiratory rate is seen in response to low oxygen levels (rather than rising carbon dioxide levels as in other species). Low relative humidity can lead to dehydration in reptiles due to evaporative loss.

**Principles**

General veterinary knowledge and training can be applied to exotic species. A full clinical examination should usually be performed before commencing treatment. However, for some patients the stress of restraint could be fatal. In these cases, basic treatment should be provided to stabilise them before further investigation is performed. This may include provision of oxygen (for example, placement in an oxygen-enriched enclosure), warmth, and fluids (such as by the subcutaneous or oral routes as these can be performed rapidly; Figure 1). An accurate bodyweight should be obtained – this will give some indication of the patient’s condition and also permit accurate dosing of drugs.

**Basic equipment**

In an emergency situation, existing equipment in the practice can be adapted. If the practice routinely treats exotic species, consideration should be given to buying more “specialist” (often this means smaller) equipment and consumables.

Adequate housing facilities for exotic pets in a critical condition is of vital importance, and these must be secure as well as accessible for monitoring and administration of treatments. Mammals and larger birds can be housed in regular enclosures in some instances, but many patients are small enough to escape from cages with bars designed to hold other species. Cages with narrow bars or solid-sided enclosures are usually required. Birds should be provided with perching options, though in critical cases these should be low or even replaced by soft substrate to prevent trauma if they fall from a high perch. Reptiles require a vivarium where the environmental temperature can be elevated to their preferred optimum temperature range (which varies between species, being around 20°C to 30°C for many). Portability of enclosures ensures versatility, such as placement in a quiet area away from predator species.
As mentioned, provision of supplemental heating is necessary in most critical care exotics cases. Incubators or brooders are very useful, though the environmental temperature should be monitored and not trusted to the thermostat. Cheaper alternatives are electrical heat bulbs, heat mats or forced air blankets in or just outside the enclosure. Hot water bottles may be used, but any heat source should be positioned or covered to prevent contact burns and if the patient is recumbent it should be checked frequently (for example, by rectal thermometer in mammals) to ensure it is not overheating. Although cloacal temperature in birds and reptiles is a more reliable measure of core body temperature than environmental temperature measurement, the latter is frequently monitored to reduce stress and/or potential damage to the patient. Digital thermometers should be used (for both animal and environmental measurements). In cases of hyperthermia, a method of cooling the animal is required, such as fluids at room temperature or ice packs.

Nutrition is paramount to supportive care in critical patients. Diets appropriate for the species should be offered. Many patients require assisted feeding from syringes or via tubes, but these may stress the patient so some require surgically placed gastrointestinal feeding tubes for long-term nutritional support (Figure 2).

Small syringes and catheters can be used for small animals. Soft feeding tubes should be lubricated before insertion into the gastrointestinal tract, and usually a gag (for example, a bandage-covered tongue depressor) placed in the side of the mouth to avoid the patient damaging the tube. Metal crop feeding tubes are available for use in birds, but soft plastic tubes may also be used (usually a metal gag is required, taking care not to damage the bird’s beak).

**Emergency equipment**

Unless you work within a single room in the building, it is beneficial to have a small crash kit that may be transported with a critical patient. This should contain selected items that will assist in case of arrest or difficulties encountered in an anaesthetised patient (Panel 1). Resuscitators, such as bag valve masks, are useful and may be attached to endotracheal tubes or face masks to provide air to patients. Care should be taken to avoid undue stresses during restraint of critical patients, but a diagnosis is necessary to facilitate treatment in some instances. The patient may require stabilisation before beginning investigations.

Haematology and biochemistry results may assist diagnosis and treatment of critical exotics patients. Unfortunately, many of these animals are small and, consequently, blood samples may be difficult to attain, and aliquots small (Panel 2). Achieving venipuncture may require sedation or anaesthesia (after balancing the risks of the procedure) along with practice.

The latter can be combated by performing in-house haematology analysis on a microhaematocrit tube (for packed cell volume) and microscopy of a drop of blood on a slide (for estimated cell counts), and biochemistry using analysers capable of performing tests on small samples. For some species, blood pressure can be monitored, usually indirectly using a Doppler probe and
sphygmomanometer. Imaging techniques may be used to determine the disease aetiology or monitor progress.

**Consumables**

In general, consumables for critical care of exotic pets are similar to those required for other species, but in smaller versions (**Panel 1**). Common drugs useful in critical cases include adrenaline (for cardiac arrest), anticholinergics (for bradycardia), dexamethasone (some cases of shock, but note that severe immune suppression may result especially in rabbits and birds), diazepam (for seizures), doxapram (respiratory stimulation, note that some adverse effects have been noted), furosemide (or other diuretic for heart failure, pulmonary congestion or oedema), lidocaine (for cardiac arrhythmia), and anaesthetic drug reversal agents.

Analgesics should be provided for exotic species, as for other animals, as pain will slow recovery from illness. Once a diagnosis has been reached – or is suspected – medication can be administered for the specific condition (**Figure 3**).

**Emergency treatment**

Apply other basic principles to emergency treatment of exotic pets. In cases of cardiac or respiratory arrest, perform cardiocerebral pulmonary resuscitation (CCPR) on collapsed patients (**Panel 3**). Where possible, venous access should be attained for administration of fluids and drugs as required (see **Panel 2** for venipuncture sites).

**Follow-up**

Exotic animals often require a prolonged period of care after emergency treatment. Although staff can breathe a collective sigh of relief when the patient is no longer critical, continued monitoring and care is required. Re-evaluate the animal’s history and results from investigations – and/or perform further investigations at this point – to adjust treatments.

Continue oxygen supplementation until the patient is stable. Monitor body temperature, restoring normality using active warming or cooling as appropriate. Fluid support is necessary in most cases (see below) to treat dehydration or blood loss, hypovolaemic shock, and to provide maintenance requirements. Monitor urine output as well as fluid intake.

**Fluid administration**

As mentioned, many exotic patients require fluid support (**Panel 4**). In critical patients, this is best achieved via access to the circulatory system – either an intravenous or intraosseous catheter. Alternative routes of administration include subcutaneous and oral.
intraperitoneal/intracoelomic route may be used in some species (though not recommended in birds due to the risk of air sac puncture).

Use lactated Ringer’s solution to replenish fluid and electrolyte deficits and dextrose/saline to support intravascular fluid volume. Glucose is useful in cases of anorexia, preanaesthesia in small animals where a prolonged procedure could rapidly lead to hypoglycaemia, or for treatment of pregnancy toxaemia in guinea pigs. Colloids are used for patients in hypovolaemic shock or hypoproteinaemia and are often given with crystalloids to reduce (by 33 per cent to 50 per cent) the volume of crystalloids necessary. Reptiles placed in shallow warm water will often drink – this can be done once or twice a day for 10 to 15 minutes.

Liquidised diets are extremely useful for critical care of exotic animals as they provide nutrients concurrently with fluids. Proprietary nutritional support diets, baby food and liquidised pellets can be used – ensure the content is appropriate for the species in question. Foods and fluids should be warmed before administration.

Blood transfusions have been used successfully in several mammalian, avian and reptilian species to treat severe anaemia. Similarly, haemoglobin solutions have been administered in some species.

Summary

Veterinary clinicians can deal with critical care in many different species. Using these skills they can offer more options to treat critically ill exotic pets.

• Some of the drugs mentioned in this article are used under the cascade.

Further reading


PANEL 1: EXOTICS CRASH KIT
• Intubation equipment
  – uncuffed endotracheal tubes, 1.0mm to 6mm diameter; laryngoscope with Wisconsin blade, size 0 to 1.0 or otoscope

• Intravenous catheters
  – 10 to 26 gauge

• Needles – 18 to 24 gauge

• Syringes – 1ml to 5ml

• Ocular lubricant

• Adhesive tape

• Drugs – adrenaline, atropine, doxapram, diazepam, local anaesthetic spray and ointment

PANEL 2: COMMON VENIPUNCTURE SITES

• Rabbits – jugular vein, marginal auricular vein, lateral saphenous vein

• Rodents – lateral saphenous vein, jugular vein, cephalic vein, femoral vein, lateral tail vein (rat)

• Ferrets – jugular vein, lateral saphenous vein, anterior vena cava

• Birds – jugular vein, superficial ulnar vein, superficial plantar metatarsal vein (particularly waterfowl)

• Lizards – ventral tail vein (take care in species such as leopard geckos that may autotomise their tail), cephalic vein (cut-down), jugular vein (cut-down)

• Chelonia (tortoise, turtle, terrapin) – jugular vein, dorsal tail vein, sub-carapacial sinus (may be contaminated by lymph)

• Snakes – cardiocentesis, ventral tail vein
PANEL 3: PRINCIPLES OF CCPR (ABCDEF)

- Airway – ensure the airway is patent and intubate if possible
- Breathing – provide intermittent positive pressure ventilation or thoracic wall compressions
- Cardiovascular – if possible, intravenous or intraosseous access can be used to administer fluids or drugs, external thoracic wall compressions will result in cardiac compression
- Drugs – may be useful (see text)
- Electrical defibrillation – not currently applicable to small species
- Follow-up – continue to monitor the patient and provide supportive care

PANEL 4: SAMPLE DAILY MAINTENANCE FLUID REQUIREMENTS

(refer to other resources for detailed information)

- Mammals: rabbits, 100ml/kg to 150ml/kg; chinchillas, 30ml/kg to 60ml/kg; ferrets 60ml/kg to 70ml/kg.
- Reptiles: 50ml/kg to 100ml/kg.
- Birds: 40ml/kg to 50ml/kg (higher than this in small passerines).