Rescue and First Aid for Wildlife

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For our wildlife "we are both their greatest enemy and their only hope.

These wonderful creatures will not argue their case.
They will not put up a fight.
They will not beg for reprieve.
They will not say goodbye.
They will not cry out.
They will just vanish.

And after they are gone, there will be silence.
And there will be stillness.
And there will be empty places.
And nothing you can say will change this.

Nothing you can do will bring them back.
Their future is entirely in our hands."

Bradley Trevor Greive.
International Best-Selling Author and Passionate Wildlife Conservationist
Priceless. The Vanishing Beauty of a Fragile Planet.

Photos: Lee Pirini (Koala – front cover) and Green Sea Turtle (above)

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Acknowledgments

We are deeply indebted to a number of wildlife veterinarians in South-east Queensland who have for many years provided invaluable support to the Wildcare trainers and Species Coordinators. Their generosity in donating their time, knowledge and experience has enabled us to further our knowledge as wildlife rehabilitators, which in turn enables us to provide high quality training programs to others.

We are very fortunate to have veterinarians with the level of dedication, compassion and patience that we have. Without their support, training material such as this would not be possible.

We wish to thank and acknowledge the following veterinarians have contributed to the Wildcare education program:

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Introduction

As a volunteer wildlife rehabilitator, you will be faced with the regular task of rescuing sick, injured and orphaned wildlife. In order to provide a high standard of care, it is imperative that wildlife volunteers have the skills to assess these animals when they first present for care. The rescue and initial emergency care stage is often the most crucial in an animal's rehabilitation.

In additional to rescuing native wildlife, most wildlife volunteers will care for wildlife in their own homes. Therefore, it is essential to have a basic understanding of first aid principles and be able to implement good management practices so you can confidently provide for their needs.

The objectives of this training manual, along with the Wildcare training workshops, is to ensure that wildlife volunteers can:

- Efficiently perform an initial assessment in order to triage sick and injured wildlife
- Efficiently conduct a thorough assessment of common species of native wildlife (where it is safe to do so and within the capabilities of the individual wildlife volunteer)
- Recognise common injuries, diseases and conditions of common species.
- Recognise those injuries and conditions that warrant immediate veterinary attention.
- Understand basic veterinary terminology and procedures.
- Understand the principles of good hygiene and quarantine.
- Understand the management techniques used when rehabilitating sick and injured wildlife.
- Understand the basic principles of humane euthanasia.

The Wildcare Rescue and First Aid for Wildlife training workshop is designed as a basic training course for new wildlife volunteers embarking on their journey to become a wildlife transporter, rescuer or carer.

These training notes also provide more detailed information to assist wildlife rehabilitators of all levels of experience on how to appropriately manage sick and injured wildlife in their care.

How to Use this Training Manual

This Manual contains information suitable for both new and experienced wildlife volunteers. It contains over 450 pages (excluding the Appendices) of information and photographs which we hope will help you in your goal to be an efficient and ethical wildlife rescuer and carer.

Saving to your computer or iPad

We recommend you download the training manual and resources from the link provided to your computer hard drive. Create a 'shortcut' on your desktop so that you can access it quickly.

You can also copy the documents to your tablet or smart phone. We recommend saving a copy of the Species Information Sheets to your phone so you can access them readily.

Safety

Wildcare has developed a Safety Management Manual, the goal of which is to protect the health and safety of its volunteers and the community whilst conducting our activities. Health and safety are the responsibility of each and every member, so it is essential that you become familiar with and adhere to the safety procedures outlined in the Safety Management Manual and all Wildcare training manuals, training workshops and policies and procedures.

Species Information Sheets

If you are not going to print this Manual in its entirety, we would recommend you at least print the Species Information Sheets. These Sheets are designed to be an 'easy reference guide' for common species and will assist you with providing appropriate emergency care. We suggest you print and bind these, so you have easy access to them. Many of our rescuers keep a copy of the Species Information Sheets in their rescue kit. Wildcare can provide printed copies of this manual for a nominal cost (to cover printing and binding expenses).

An important element of the Species Information Sheets is the Suggested Drugs and Dose Rates. Although not intended for use by wildlife rehabilitators, it is a good resource to keep on hand when attending a vet with a species which they are unfamiliar with. This list has been compiled with the generous help of experienced wildlife veterinarians and will be invaluable to many small animal clinics.

If you would like your local veterinarian to be provided with a copy of this Manual, please contact Wildcare and we will organise to provide an electronic copy to them. We ask that you do not copy this Manual and distribute yourself. This will ensure that we are providing the most up to date version.

Attending other training workshops

Although this Manual is fairly comprehensive, it is still no substitute for attending species-specific training workshops. It is imperative when dealing with any species that you learn as much about them as possible. This Manual and training course deal predominantly with rescue and initial care only. If you intend on rehabilitating these animals, it is important that you understand specific rehabilitation techniques and gain a more in-depth knowledge of diseases and conditions for that species.

Warning about photographs

This Manual contains a large number of photographs of sick and injured wildlife. In most of the photographs the animal has either been euthanised, has died or is under a general anaesthetic (or has been administered an anaesthetic or is in the process of being anaesthetised). We are indebted to the Australia Zoo Wildlife Hospital and those wildlife rehabilitators that have shared their photo libraries to enable this Manual to be developed.

Advanced Rescue Techniques

This Manual does not cover in-depth information on rescue techniques for specialised species such as venomous snakes, koalas, adult macropods and bats. If you are interested in becoming involved with these types of rescues, you should attend the specific training workshop for that species.

Wildlife Rescue

Grey-headed Flying Fox entangled on barb wire.

Introduction

Wildlife rescue is the act of responding to a report of a sick, injured or orphaned wild animal or bird. It involves removing it from danger and providing for its immediate needs such as delivering essential first aid, warmth and security and ensuring it receives appropriate veterinary care as soon as possible. The primary outcome for rescue is to relieve suffering with the aim of returning the animal to the wild. Release is sadly not always the outcome, but an appropriate response to a wildlife rescue will have a significant impact on the wellbeing and future of the animal being rescued.

Volunteer wildlife rescuers provide a valuable public service to the community. By being available to undertake rescue activities, the risk to public safety is reduced as they are not required to handle dangerous wild animals. The common thread between volunteer wildlife rescuers is a shared desire to help wild animals. It is an act of compassion and empathy and induces a feeling of moral obligation that all living animals should be respected, and their value recognised. The fact that more people are actively becoming wildlife rescuers and carers and entering into other areas of wildlife conservation, speaks to our own increased personal values.

The reason that a native animal will come into care is varied. The activities of humans have altered the balance of nature in so many different ways and by doing so has caused, inadvertently or deliberately, most of the problems experienced by our native wildlife.

Some of the most common threats to native wildlife include:

Habitat Destruction

Habitat destruction is the largest threat to wildlife worldwide. Clearing for housing estates, golf courses, farms and industry as well as the destruction caused by bushfires (most of them deliberately lit), floods and other natural disasters, the draining of swamps and wetlands, building dams, roads and railways all contribute to the loss of wildlife and their habitat. Although we tend to think of habitat destruction as taking place on a large scale, it can be as simple as cutting down one tree or flowering native shrub in your own backyard. The animals that survive the initial destruction are then faced with the loss of protection from predators and shelter from the elements and the loss of food resources. These animals are forced to move into surrounding areas that may already be occupied, resulting in them having to compete for resources.

Trauma

Trauma can include motor vehicle accidents, hitting windows, domestic animal attacks, electrocution, lawn mowers and garden trimmers, shooting and injury deliberately caused by humans by either malicious or unintentional acts.

Domestic dogs and cats

Predation by domestic animals on our wildlife is increasing at an alarming rate. Most attacks on wildlife occur in urban backyards by domestic dogs and cats. Attacks also occur when pets are not confined in a yard (e.g. dogs roaming during the day, cats left outdoors at night), but also when fenced off areas for domestic pets contain trees that are used by arboreal wildlife.

Poisoning

Poisoning is another threat to our native wildlife. Poisons include pesticides, herbicides, fertilisers and rat poisons, as well as sewerage and industrial waste, which are often discharged into waterways. Oil spills have the potential to contaminate vast areas and affect large numbers of wildlife.

Orphaned

Baby birds can fall from nests and are sometimes unable to be reunited with their parents. Baby birds and mammals can become separated from their parents or the parents killed. These orphanings often occur as a result of human interference such as cutting down a tree with a nest in it. Many marsupial orphans enter care as a result of road trauma or domestic animal attack.

Human Interference

Fledgling birds are often picked up by well-meaning humans and removed from the area while the parent bird is foraging for food. If they cannot be re-united with the parents, then they will need to be hand-raised.

Artificial Diets

Inappropriate and nutritionally deficient diets are fed to thousands of birds and other wildlife, every day. The results are often young animals and birds suffering calcium deficiencies, retarded and poor feather or fur growth, and a general overall reduction in the health of the animal.

Disease

Wildlife suffers from a variety of different diseases. Some diseases (e.g. bat viruses) only become an issue and attract the media and research opportunities when they are perceived to be a threat to humans, domestic animals or livestock. Other diseases (e.g. Chlamydia in koalas) are considered a key threat to the species' survival.

Becoming a Wildlife Rescuer

Wildlife rescue is an activity which requires different skills to those required when rescuing or handling domestic animals or livestock. Their natural response and defence mechanisms can make the capture and handling of them dangerous to the rescuer, bystanders and can result in further injury to the animal itself.

It is imperative that anyone involved in the rescue of wildlife receive proper training in the handling, housing, feeding and general care of the species they are going to rescue. They must also be appropriately trained to use various equipment and be prepared to work with other wildlife rescuers and/or wildlife conservation and animal welfare authorities.

All wildlife rescuers must understand the basics of the natural history of the species they may be called upon to rescue. A large part of the rescue process is being able to understand whether the animal is behaving normally or not. Being familiar with the species strengths and weaknesses will help in the planning and safe execution of a rescue. It also helps to ensure that the animal actually requires rescuing.

What are you going to rescue?

South-east Queensland is an area rich in wildlife and has the highest diversity of many species in Australia.

Based on our Wildcare record keeping statistics, the table below gives you an idea of the most common wildlife species you may expect to rescue.

Birds	55%
Possums and Gliders	20%
Macropods (kangaroos, wallabies, pademelons)	9%
Reptiles	6%
Koalas	4%
Bats	3%
Small Marsupials and Mammals	2%
Monotremes (echidnas and platypus)	1%

Your location, available equipment, vehicle type and your ability to travel, will determine which wildlife species you may be called upon to rescue. You should, however, be prepared to rescue almost any wildlife species as you never know when you will come across an injured animal on your travels. There are some species such as koalas, adult macropods, large or venomous reptiles, bats and echidnas that do have specific rescue requirements and require additional considerations such as specialised training and equipment.

Wildcare Australia Rescue Procedure

Rescues coordinated through Wildcare, are generally coordinated as follows:

1. The Wildcare Hotline operator will endeavour to obtain as much information as possible. The most important details include the name, address and contact number of the caller, the location where the animal is situated, the species identification and the nature of injuries/condition. Having the exact location where the animal was found is important when returning them to the wild, particularly for territorial species and those with a strong home-range.

2. The Wildcare Hotline operator will provide advice to the caller where they can. This advice may include ensuring the animal does in fact need to be rescued and if so, what to do with the animal until a rescuer arrives. If the animal is not contained, the Hotline operator will usually ask the caller to contain the animal by placing a box or laundry basket over the animal until help arrives (if it is safe to do so).

3. Wherever possible, the Wildcare Hotline operator will encourage the caller to help by taking the animal to their closest vet or wildlife hospital. For most garden birds and small mammals, members of the public are generally confident to be able to pick up an animal and place it in a box and transport it to a vet. Some species and rescue scenarios are considered more complicated, and in these instances, we would not ask members of the public to assist.

4. If the caller is not able to assist by taking the animal to their closest vet, or if the animal or situation is considered to be dangerous to the caller, then the Hotline operator will find a suitable rescuer to attend.

5. As a wildlife rescuer, once you receive the call from the Hotline, it is recommended you call the member of the public and identify yourself and get any other information you consider necessary. Other information you may require could include: has it been captured, is it on the ground, in a tree, how high etc? Provide the caller with an estimated time when you will arrive or ask if they can deliver the animal to you (if the animal is already contained).

Wildcare Emergency Hotline

07 5527 2444

Factors Affecting Wildlife Rescues

There are many factors that influence how difficult a wildlife rescue will be.

Rescues that should be relatively straight-forward and pose minimal risk to the rescuer include:

- Rescues performed during day-light hours
- Where the animal is already contained in a box
- Where the animal is on the ground
- Orphaned joeys (the risk of being bitten/scratched is minimal)
- Critically injured wildlife (they are generally in an advanced state of shock and not reacting as they would otherwise). However, you should always be prepared if the animal becomes responsive once initial warmth is provided!

Rescues become more complicated and impose a greater risk to the rescuer when:

- The rescue is performed at night
- The animal is still mobile (it can still run or fly)
- The animal is in a tree
- The animal is entangled (e.g. fishing line, barb wire, fruit netting)
- The animal is a high-risk animal (such as an adult macropod, koala, large or venomous snake or bat)
- The animal is otherwise healthy but in a dangerous situation (e.g. entangled high in a tree)
- The animal has endured a stressful incident (such as being mauled by a dog or being in close proximity to too many people)

Wildlife Rescues - Summary

Do:

- Have all required equipment ready beforehand
- Ensure that your identification skills are excellent (particularly when dealing with snakes)
- Be familiar with species-specific requirements (some species do not tolerate warmth/heat)
- Be firm (but gentle) when handling all species
- Be as efficient as possible with timing, capture and transferring the animal into an appropriate transport carrier
- Assess for visible signs of injury or disease prior to and during capturing and handling
- Immediately cover the transport carrier once the animal is contained
- Place the container in dark and quiet environment
- Use your common sense

Don't:

- Don't become relaxed with handling techniques or stop wearing protective gloves when required – or you will get bitten!
- Don't be fooled – little critters still bite – HARD!
- Don't assume: "Cute and fluffy" doesn't mean "Cute and CUDDLY"
- Don't expect wild animals to be predictable – they aren't!
- Don't remove joeys (if attached to the mother's teat) from dead marsupials unless you are familiar with the correct procedure.
- Don't handle any snake unless it has been positively identified as being non-venomous (unless you are appropriate venomous snake handling training and experience)

Rescue Equipment (Basic)

When you first start as a wildlife rescuer, you will only be asked to attend simple rescues until you gain more confidence and knowledge. Simple rescues are generally ones where the animal is already contained. To get started, you only need a very basic rescue kit, the contents of which are easily sourced and may include the following items. Some of these items are available through Wildcare from donated supplies.

Cardboard boxes

They come in a variety of sizes to suit a range of species. They are free, readily available and lightweight. Punch a series of holes along the side and top for ventilation (prior to placing the animal in the box). Keep a roll of packing tape handy to secure the lid during transport. Photocopy paper boxes are great for transporting small to medium birds.

Source from: Offices, retail outlets
Cost: Free

Plastic picnic basket

These are a popular choice for wildlife rescuers and carers. Suitable for some birds and small mammals. Not suitable for larger birds or raptors as can result in feather damage, nor are they suitable for an active mammal, particularly adult possums etc as they could easily push out of it.

Commonly used by orphan carers for initial stages of caring for possums, gliders etc.

Source from: Variety discount stores
Cost: $15 - $20 each

Pet Pack

Pet Packs are generally made from cardboard or corflute. They are inexpensive and easily cleaned.

Source from: Vet clinics and pet shops
Cost: $15 - $25 each

Solid plastic tub with clip-on lid

Suitable for short-term transport of small mammals and non-venomous reptiles. Requires holes drilled into the lid for ventilation. Dark coloured tubs are preferable over opaque/clear tubs as the dark interior will help reduce stress on the animal.

45 litre containers are a good size for most wildlife.

Source from: SuperCheap Auto have good quality containers.
Cost: ~$9 each

Towels and blankets

Small towels are useful to line the bottom of boxes. Large towels and blankets to capture and restrain animals.

NOTE: Avoid red (or hot pink) towels as some birds are distressed by this colour.

Handtowels and facecloths are also handy to restrain smaller species.

Source from: Wildcare or purchase from op-shops
Cost: Free from donations

Leather gloves

Gardening or rigger gloves are suitable. Prevents bites and scratches. Often available in mens and ladies sizes. Most brands can be cleaned between rescues without damaging. Spraywith F10® and allow to dry thoroughly.

Source from: Hardware stores
Cost: $3 - $20 depending upon quality

Disposable gloves

Use when handling diseased animals or where there are significant amounts of blood. Use latex-free gloves for your own safety.

Required for Covid-19 precautions.

Source from: Supermarkets, Wildcare
Cost: Free from donations (Wildcare) or ~$5 pack from retail outlets.

Torch and/or Head Lamp

Essential for night rescues or rescues in dark places. Headlamps enable you to keep both hands free to capture and restrain the animal.

Keep spare batteries in your kit.

Purchase as good a quality torch as you can afford. Look for torch with a high lumen (1000 is good).

Rechargeable torches are a good option.

Source from: Hardware or tool retailers
Cost: $10 - $300 depending upon quality

Hot water bottle

Use to provide artificial warmth to rescued wildlife.

Do not fill with boiling water – only use warm to hot tap water.

Source from: Variety stores, chemists.
Cost: $5 - $10

Snuggle-safe® heating disk

Preferred option for most wildlife rescuers and carers. A better alternative to a hot water bottle.

Solid, hard disk which is heated in the microwave and will remain warm for up to 8 hours.

Source from: Pet shops, eBay, Wildcare.
Cost: RRP $90. Wildcare $35.

Scissors

Small scissors (such as cuticle scissors) are used to cut the teat in deceased marsupials' pouch.

Larger scissors are useful to cut string, rope, fishing line etc in entangled wildlife.

Heavy duty scissors are useful for cutting sturdy fabrics such as shade cloth, rope, cable-ties etc.

Source from: Chemists, retail outlets or hardware stores
Cost: $3 - $20 depending upon size and quality. Donated items sometimes available through Wildcare.

Safety pins

Used to secure mother's teat when rescuing orphaned marsupials. A pack of a variety sized pins is handy.

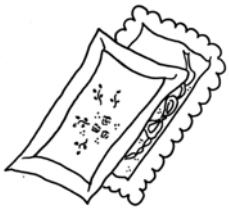
Source from: Chemist, retail outlets or variety stores.
Cost: $2 - $5 pack.

Pouches

Used to contain orphaned joeys. You will need a variety of sizes to accommodate different species and ages.

Source from: Hand-make or through Wildcare
Cost: Free. Patterns for pouches available to download from Wildcare website.

Cotton pillowcases



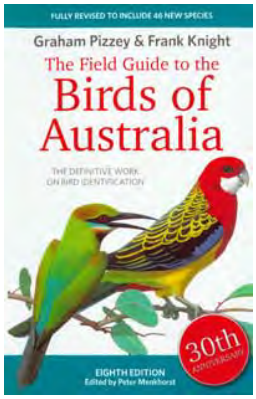
Suitable for securely containing small mammals and reptiles. Secure with a cable clamp, rubber band or shoelace.

Source from: Home, op-shops, Wildcare
Cost: Free from donated supplies.

Water bottle

Always carry a bottle of drinking water in your vehicle. Not only is this essential to prevent dehydration for yourself, but it can also be used to dampen a rescue towel or blanket for an animal that needs to be kept cool (e.g. echidna, sedated macropods).

Field Guides



Field guides are available for all species of Australian Wildlife. Some field guides are more general in nature and cover the most common species that are found in specific regions (e.g. Wildlife of Greater Brisbane), whilst other guides focus on a particular species.

Source from: Refer to the Recommending Reading List in Section 8.
Cost: Varies. Often available second-hand through op-shops and eBay.

Smartphone apps

There is now a great variety of free and low-cost apps available to download to your smartphone. These are a great resource and are much easier than carrying physical books in your rescue kit.

First Aid Kit

All wildlife rescuers should carry a basic first aid kit in their vehicle as well as a snake-bite kit. Refer to the section on PPE to follow.

Most wildlife rescuers keep these items in a 'rescue kit' in their vehicle or garage, so they can access them quickly when required. The plastic picnic-style baskets and smaller rectangular plastic tubs are handy to keep everything together, are easily cleaned and disinfected and are relatively cheap to purchase.

Rescue Equipment (Advanced)

As you become more confident, you may choose to undertake more complex rescues. As you progress, you will likely add other pieces of equipment to your rescue kit to accommodate more varied rescue scenarios. And, before you know it, your car will look more like a wildlife rescue vehicle than a person transporter!

Advanced rescue equipment required will depend upon which species you are rescuing. The list below provides a brief overview of the some of the equipment used by rescuers. Please note that you do not need to have all of these items.

Many of these items can be expensive, so keep an eye out for second-hand items in good condition available through Gumtree, Facebook Marketplace or local Buy/Sell/Swap pages. Some more expensive items are available to loan from Wildcare.

Nets

A net is useful for capturing birds and mammals that are still mobile. Some nets are available with telescopic handles which provides a greater reach.

Nets come in a variety of mesh sizes. Fine, smaller mesh is suitable for smaller animals and a larger mesh size is good for larger, stronger animals.

Fish landing nets are a cheap and readily available option when you are starting out. More expensive and better-quality nets available through wildlife equipment retailers.

Source from: Fishing/camping stores, Big W, Kmart.
Cost: $10 - $100 depending upon size and quality.

Specific animal handling nets are available from:
Animal Care Equipment & Services
http://animal-care.com.au/

Extendable pole

Use with a net, hoop or flag-deterrent (for flagging koalas down from trees) or attached towel/cloth for obtaining bats from trees. Extendable paint roller or pool cleaning poles are cheap and readily available at hardware stores.

Extendable pole with tree saw

For cutting branches with entangled wildlife (e.g. bats and birds). Hardware stores carry a selection of tree loppers with a tree saw and/or lopper attachment. Longer, heavy duty ones are available through arborist suppliers.

Source from: Hardware retailers
Cost: $50 - $100 depending upon brand and quality.

Strong wire pet carry cage

A strong cage will be required for larger animals such as adult possums, cockatoos, koalas, lace monitors.

Garbage bin with clip-on lid

Drill small-medium holes in lid for ventilation.

Preferred method to transport echidnas as they are much less likely to escape. 75 litre bins are an ideal size. Smaller bins are only suitable for smaller echidnas.

Source from: Mitre 10 stores have the clip-on lid bins.
Cost: $20 - $25

Instant heat packs

Reusable heat pack. Can be activated for instant heat that will last up to several hours depending upon the size.

Reusable after being placed into boiling water for 10-20 minutes.

Source from: First Aid suppliers, eBay, chemists.
Cost: $5 - $50 depending upon size and quality.

Small bolt cutters

Use as an alternative to wire cutters; easier to use on thicker wire and barbed wire.

Source from: Hardware retailer.
Cost: $10 - $25 depending upon brand and quality.

Strong scissors (e.g. Kitchen Shears) or tin-snips

Used for cutting strong netting such as fishing line, fruit netting, shade cloth etc.

Source from: Hardware retailer.
Cost: $10 - $25 depending upon brand and quality.

Secateurs

To cut browse/leaf to provide to wildlife as a food source.

Source from: Hardware retailer.
Cost: $10 - $100 depending upon brand and quality.

Collapsible ladder

Easy to fit into a standard sized car. Essential for rescues entangled on high barb wire or high in a tree.

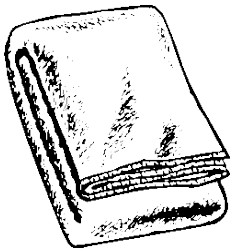
Source from: Hardware retailer.
Cost: $50 - $200 depending upon length, brand and quality.

Folding step stool

Easy to fit into a standard sized car. Great for general rescuers where you need a little more height.

Source from: Hardware retailer.
Cost: $20 - $40 depending upon brand and quality.

Thick blankets



Use for large mammals (such as adult macropods) or as a capture/fall blanket under an animal being rescued from a tree.

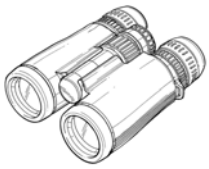
Source from: Wildcare, op-shops.
Cost: Free from donated supplies.

Macropod bag

Large bag made from strong cotton material or lightweight canvas for containing injured adult wallabies and small kangaroos.

Source from: Wildcare
Cost: Variable depending upon cost of fabric (~$20)

Binoculars



Good for assessing arboreal animals or animals at a distance.

Source from: Sporting stores or online retailers.
Cost: $20 - $200 depending upon brand and quality.

Assorted cable-ties and fasteners

A variety of cable-ties in varying sizes are useful for securing equipment and keeping cages and bags closed.

Tarpaulin or “bungee balls” are also a handy item to keep in your kit and can be purchased from hardware stores.

Cable clamps

Handy clamps to quickly secure pillowcases and bags closed.

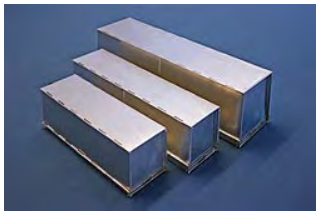
Source from: Hardware retailer.
Cost: $3 - $50 depending upon size.

Humane possum (cat) trap

Used to humanely trap sick and injured possums in order to seek veterinary treatment. Available in a variety of sizes and with either a hook or foot plate mechanism.

Source from: Animal trapping suppliers, eBay.
Cost: $40 - $100 depending upon size and quality.

Humane 'Elliott-style' traps



Used to humanely trap small mammals such as antechinus and rodents. Not commonly used in wildlife rescue scenarios.

Source from: Animal trapping suppliers.
Cost: $30 - $50 depending upon quality.

Plastic Terrariums

Suitable to temporarily house small reptiles and mammals (clear plastic sides should be covered to reduce stress).

Commonly used to house insects for feeding to wildlife (such as mealworms, crickets, wood cockroaches).

Source from: Pet stores, variety discount stores.
Cost: $10 - $30 depending upon size and quality.

Collapsible Crates

Good for overnight or short-term housing for mammals such as possums. Cover with shade-cloth or secure cloth cover. If being used outside, must be covered with fine mesh to snake-proof.

Source from: Pet stores, online retailers.
Cost: $50 - $150 depending upon size and quality.

Collapsible Soft crates

Good for overnight or short-term housing for mammals such as possums and gliders.

Source from: Pet stores, online retailers.
Cost: $40 - $150 depending upon size and quality.

Intensive Care Units

Although expensive, these intensive care units made by Vetario, Brinsea and R-Com are ideal if you rescue wildlife frequently. They are commonly used to house orphaned joeys and baby birds to keep them at a consistent temperature and to humidify the air.

Source from: Online retailers.
Cost: $800 - $1800 depending upon size and brand.

Large animal nets

Suitable for large birds, adult wallabies or small-medium kangaroos. Much stronger than fish landing nets.

This particular brand is a Magnum Net available through Animal Care Equipment – www.animal-care.com.au

Snake Handling Equipment

Recommended equipment includes:

- Snake hook
- Snake bag
- Cotton pillow cages with ties
- Gloves
- Plastic container with ventilated and secured lid
- Snake identification guide
- Snake bite kit

Complete snake handling kits (pictured) are available through Geckoes Wildlife Presentations – www.geckoeswildlife.com.au.

Personal Protective Equipment

The risks associated with handling sick and injured wildlife can be mitigated by ensuring you utilise appropriate personal protective equipment ("PPE"). When selecting appropriate PPE, a number of factors need to be considered including the species of animal involved, the task and the environmental conditions.

Choosing the correct piece of equipment for the task is critical. Below is a list of commonly used PPE.

Gloves

Gloves are one of the most important pieces of PPE that a wildlife rescuer will use. Having a variety of gloves in your rescue kit will ensure you have an appropriate pair available for each task.

Disposable/examination gloves

- Usually made from latex, rubber or nitrile
- Are thin and offer the least amount of protection from bites or scratches
- Wear two pairs if working with hazardous materials
- Nitrile gloves are slightly thicker and are more durable
- Consider your need for Latex-free gloves (e.g. many hospital workers are at risk of building up latex allergy over time due to overuse)

Leather gloves

- Can help to prevent being bitten or scratched
- Do not offer much protection from chemicals or fluids (can wear disposable gloves underneath for added protection from hazardous materials)
- Come in a variety of thicknesses and lengths
- Available in both men and ladies' sizes so you can obtain a good-fitting pair

Welding gloves

- Made from thicker leather
- Provide a better barrier against punctures
- Not as flexible and significantly reduces dexterity

Protective gloves

- Made for tradesman
- Useful when handling equipment such as poles/nets
- Increases gripping ability
- Wide range available through hardware and tool stores
- Allow for good grip while maintaining dexterity
- Provides limited protection against bites and punctures

Purpose-made animal handling gloves

- Offer superior protection against bites, scratches and punctures
- Expensive
- Order through specialised wildlife equipment suppliers

Eye and Respiratory Protection

Choose eye protection that fits well and does not compromise your vision. Examples include:

Safety glasses / face shields

- Come in a variety of shapes, sizes and colours
- Come in a design that fit over prescription eyewear
- Safety glasses are useful for long-necked birds that can strike at the face
- Only provide protection to the eyes – face shields offer much higher degree of protection
- Use face shields when dealing with hazardous materials

Face shields

- Used to shield the mouth and nose from hazardous airborne materials

Medical/surgical masks

- Non-woven, disposal masks are easily obtained and are a better option that paper masks
- Will not guard against aerosolized dangers
- Required as a Covid-19 precaution

Air-purifying respirator

- Provides higher degree of protection from aerosolized hazardous materials

Footwear

Good quality footwear is one of the most important pieces of PPE that a wildlife rescuer can have. The choice of footwear should be suitable to the terrain. Take note of the following:

- Footwear should provide for stability, support, adequate traction and protection from the elements
- Footwear must be properly fitted
- Use 'gaiters' in bush or long grass to prevent debris and ticks from entering through the top of the shoe
- Use non-slip aquatic shoes in and around water

Clothing

Always wear appropriate clothing to a wildlife rescue. The clothing selected will be dependent upon the animal being rescued, the environment, the terrain, the weather and the level of activity required.

Long pants

- Long pants will help protect you from insect bites, scratches from branches and allergic reactions from flora
- Choose pants that are neutral in colour (e.g. browns, tans, beige)
- Pants should not be tight – looser pants will protect your skin from insect bites better than firm fitting pants
- Wear correctly fitted pants – wear a belt if needed and do not allow pants to fall around the hips as you are more likely to fall.

Long-sleeved shirt

- A long-sleeved cotton shirt is necessary when walking through the bush or long grass to protect from scratches, allergic reactions and insect bites
- Will provide protection from the sun
- Wear a thicker cotton shirt during colder weather or in more dangerous situations (dealing with adult macropods) and a lighter weight shirt during hot weather and in less-dangerous situations

High visibility clothing

- Fluorescent vests are a cheap and easy option to keep in your rescue kit and can be easily placed over your existing clothing
- Essential when attending rescues near roadways or in poor lighting
- Ensure you get one that fits. If they are too big or too small they can impede your rescue attempt.

Headwear

When rescuing in an area where there is a potential to be struck by falling debris, a protective helmet is recommended. On some sites, you will not be allowed on site without the correct safety gear.

Safety helmet

- Come in a variety of shapes, sizes, and weights
- The choice of helmet will depend upon the level of the potential danger

Hat / Visor

- Although it will not protect the head from large falling debris it may reduce the likelihood of small debris entering the eyes

Life Jacket or Life Vest

If undertaking a rescue in or on water, always use a personal floatation device such as a life vest or life jacket.

Other Equipment Considerations

What to look for when choosing equipment:

When deciding what rescue equipment to use for a specific animal/situation, remember that equipment should:

- Be appropriate to the **species** (e.g. size, strength)
- Be appropriate to the **level of experience** of the user
- Be appropriate to the **injuries** (e.g. fractures, spinal injuries)
- Be appropriate to the **level of consciousness**
- Aim to **minimize handling**
- Provide **security** (both physically and psychologically) to the animal
- Provide adequate amount of **comfort** to the animal
- Be **convenient** (top opening cages are more appropriate for most species)
- Provide for appropriate **warmth** or **cool**
- Be easily **cleaned** and **disinfected**

Looking after your equipment

It is highly recommended that you clearly label all equipment with your name and contact number. It is easy for equipment to be lost when transferring animals for care or transport.

Inspect your rescue equipment regularly to check for damage. Keeping your equipment in good repair will aid in prolonging its life.

Cleaning and Disinfecting Equipment

All rescue equipment must be cleaned after each use to stop the spread of disease or contamination to other rescued animals. It also stops the equipment from smelling like the species that you last rescued which reduces stress in a predator-prey situation such as putting a possum into an enclosure that was last used to house a snake. Unfamiliar and predator smells can cause significant stress to wildlife.

All equipment should be cleaned thoroughly with warm-hot water and a good quality detergent to remove debris such as dirt, urine and faeces. Once cleaned, spray with a good quality disinfectant and leave to dry in the sun for a few hours before using again.

Refer to Section 4 Hygiene, Quarantine and Zoonotic Diseases for information on suitable disinfectants.

A critical component of wildlife rescue is animal welfare. The welfare of the animal being rescued is important but so too is the welfare of other animals in the immediate vicinity of the rescue site, particularly when the animal is part of a mob or group.

The best interests of all animals should be a priority. Wildlife should be captured and contained in a way which will minimise stress and reduce the risk of further injury to itself or others.

Wildlife rescuers must have a solid understanding of the effects of stress upon wild animals and the way in which they perceive humans and the physiological effects that our actions will have on them.

Stress and Wildlife Rescues

Always remember that although we are trying to help wildlife in need, in the animal's mind we are a predator. Although romantic, the notion that wildlife know that we are 'trying to help' is an idealistic misperception.

Most animals recognise predators instinctively by their eyes. Whereas most prey species have eyes on the sides of their heads giving them extended peripheral vision, predators' eyes are on the front of their faces, giving them good depth perception. To most animals, we have the eyes of a predator. You also smell like a predator. If you smile caringly at an animal, you are baring your teeth. (*Source: Rescuing Wildlife 2009*).

Now add to this the fact that the animal is incapacitated. Wildlife that are sick, injured or orphaned are already experiencing a great deal of stress. It may be suffering from dehydration, starvation, blood loss or injury. It will probably be in moderate to severe pain. It will definitely be fearful. The animal doesn't want to be rescued. If given the chance, it would hide in a quiet place and recover or die on its own. (*Source: Rescuing Wildlife 2009*).

We must appreciate that capturing and handling a wild animal, is to them equivalent to being mauled by a predator. As a result, the animal will respond as it would if it were being attacked by a predator. It will try to flee and/or defend itself, whenever possible.

A wildlife rescue will always involve some level of stress on the animal. Unfortunately, we cannot completely prevent this, but we can take steps to minimise the stress involved by:

- ensuring that the capture process is quick and efficient
- only using the minimum amount of pressure needed to restrain an animal
- minimising handling which will reduce the risk of the animal panicking and possibly injuring itself further
- minimising talking/shouting/other vocalisations other than essential instruction-giving during the rescue (most of which can be done prior to the capture)
- always housing wildlife away from predator species - placing their cage near a potential predator (natural enemy) may well cause its death
- understanding that different species will be more likely to suffer from stress at a higher level than others
- understanding that the age of an animal will affect its tolerance for being captured and handled; young animals have a higher tolerance for humans; predator species tend to be more nervous and dominant individuals may be more sensitive to handling
- understanding that initial capture upon rescue may affect the animal's response to being handled for the entire time it is in care/rehabilitation

- understanding the natural history of the species that you are dealing. Each species has unique physical and behavioural traits which can help you understand how the animal will be likely to react during rescue and behave in captivity

Capture Myopathy / Exertion Myopathy

Capture or exertion myopathy commonly occurs in Australian wildlife, particularly macropods and some bird species.

Capture myopathy is caused by trapping, prolonged restraint and prolonged pursuit to capture. It causes degeneration of muscle tissue and a build-up of lactic acid as a result of prolonged muscle exertion. High temperatures can result in myopathy taking hold much sooner than in cooler weather.

Symptoms of myopathy in macropods include stiff muscles, teeth grinding, arching of the neck and/or back, excessive salivation, excessive licking of the forearms. In acute cases, the animal may start to convulse, and death can often occur within a short period of time.

Symptoms in other species include difficulty walking or flying and weakness or lethargy. The symptoms can appear within minutes of the event or may take several days or weeks to manifest.

There is no cure for myopathy so preventing it from occurring in the first instance is the best option. The damage caused to the muscles is irreparable.

Myopathy can be minimised by ensuring that high-risk animals are captured during cooler periods. The time taken to capture the animal should be minimised as much as possible by careful planning of the rescue, using appropriate equipment and utilising a sufficient number of rescuers. Correct restraint and transport procedures should be adopted. Ideally, a Trauma Carer needs to be present so that immediate sedation can be administered upon restraint.

Does the animal really need to be rescued?

Every year, particularly during spring and summer, thousands of wildlife are brought into care that do not need to be. Thankfully, over recent years education programs have been put in place through wildlife care groups, wildlife facilities and veterinary clinics to help reduce the number of animals being 'rescued' unnecessarily. The most familiar and successful of these programs has been in relation to young birds.

In most instances, an adult wild animal that is easily captured, needs help and should be assessed by a veterinarian to rule out injury or disease.

However juvenile and baby animals are often 'rescued' by well-meaning members of the community because they fear for the animal's safety. Many of these animals simply need to be left alone or moved to a nearby safe location until its mother returns to it.

Remember:

- Mothers will not reject or kill their young because they have been touched by humans. We do need to be mindful to minimise handling in order to minimise stress but picking up a young animal and placing it back in a nest or in a safe spot nearby will not jeopardise the ability to return them safely to their parents.
- Make sure that you are familiar with the process of returning baby birds to their nest or making a make-shift nest. If the baby bird is not injured or ill, then we must make every effort to return it to its parents.
- We simply cannot bring into care every baby bird that 'may' become injured. We must leave the parents to do their job. After all, we cannot do as a good a job as they can!

All wildlife rescuers should be familiar with the procedure to reunite baby birds with their parents. ***Refer to Common Rescue Scenarios in this Section***.

Are volunteer wildlife rescuers legally able to intervene?

Another aspect that volunteer wildlife rescuers must consider is whether we are actually licensed to intervene. Rescue and rehabilitation permits issued by the Department of Environment and Science (DES) are for the rescue and rehabilitation of sick, injured and orphaned wildlife only.

Volunteer wildlife rescuers are not licensed to relocate wildlife for any purpose. Common scenarios where volunteers are asked to intervene include:

- The removal of healthy, uninjured possums from ceilings of houses
- The removal of healthy, uninjured snakes from homes and properties
- The removal of pest or nuisance animals, regardless of whether they are native or not.
- The removal of animals from other wildlife rehabilitators

In all of these situations, the caller must be referred to a commercial operator, Department of Environment and Science (DES) or licensed snake handler who holds an appropriate Damage Mitigation Permit issued by DES.

Another scenario which may be more appropriate for a commercial operator to attend, is the example of a bird trapped in a large shopping centre and is still able to fly. Wildlife rescuers are generally not equipped to capture a bird from a great height, especially a flying bird. The caller should be advised to notify the shopping centre manager. There are also concerns regarding liability and mitigation in a public facility. The Hotline volunteer can provide advice to the shopping centre manager, e.g. feasibility of opening windows or roof compartments to

enable bird's self-release, but those requiring actual rescues should be referred to a commercial operator.

Commercial operators hold appropriate insurance to cover their activities. Many of these situations require specialised equipment such as humane traps to be able to deal with these calls.

Credit: Lee Pirini

Liaising with other Authorities and Animal Welfare Organisations

In your role as a wildlife rescuer, you may need to liaise with other authorities or organisations, particularly if you become involved with more complicated rescues. It is important to understand the role of each organisation, their authority and how to best work with them to achieve a successful outcome for the animal.

We must remember that as volunteers, we have no authorisation or power to enter a property without the owner's consent. We must always follow the instructions of the appropriate authority involved.

In South-east Queensland, we find that all of these authorities work well with wildlife rescuers. We have found them to be very accommodating and compassionate towards wildlife in need. We must remember however, that the core role of many of these authorities is to maintain 'human safety'. We must understand that there may be times when other incidents or disasters are occurring that will prevent them from assisting with a wildlife rescue.

The following lists Queensland authorities. Each State and Territory will have the equivalent, but just named differently. All wildlife rescuers should have the relevant telephone contact numbers saved in their mobile phone.

Queensland Police Department ☎ 000 or PoliceLink 13 1444

Do not telephone '000' for emergencies involving wildlife unless human safety is at risk, for example where a car accident has occurred.

For non-urgent (non-life-threatening emergencies), contact PoliceLink, who will take details of the call and send to the nearest open police station – Phone **131444.**

The Police are likely to be in attendance of major accidents involving vehicles and wildlife. When in attendance, they:

- May assist with management of traffic in conjunction with Transport and Main Roads.
- They have the authority to stop and direct traffic.
- May be able to assist with management of traffic where an injured animal is involved, particularly on major roads.
- May be able to assist with the euthanasia of critically injured large wildlife (such as adult macropods), particularly in remote/rural areas. In regional and metropolitan areas, the Police generally request wildlife rescuers to attend. These calls are often reported to '000' in which case the Police may respond to the scene and stay on site until a wildlife rescuer arrives.

Energex ☎ 13 62 62

Energex is the Queensland entity responsible for the maintenance of power lines.

Any wildlife reported on or near power lines must be reported to Energex. No attempt to rescue the animal should be made without Energex workmen in attendance.

When contacting Energex, ensure that you **provide them with the number indicated on the nearest power pole** to assist them in identifying where the incident is occurring.

Energex will send a crew to assess the situation and assist with the rescue of the animal.

Rescuers must at all times follow the instructions of the Energex crew.

Transport and Main Roads ☎ 1800 13 19 40

By dialling 1800 131940 – you will be directed to the call centre in the area you are calling from.

The Department of Transport and Main Roads ('TMR') are responsible for Queensland's transport environment including road, rail, air and sea.

The TMR responds to incidents on MAJOR ROADS such as motorways, highways etc. Local Councils are responsible for traffic management on Council roads.

Reports of animals on major roads should always be reported to TMR by contacting 131940.

No attempt should be made to rescue an animal on a major road without first contacting TMR and obtaining their authority. The TMR road crews are trained to deal with many wildlife/animal related incidents. In some circumstances, they may send a Traffic Response Unit to coordinate traffic to enable a wildlife rescuer to safely extract the animal from the road. Where required, this may involve the Traffic Response Unit putting into place a 'rolling blockade' where all lanes of traffic are slowed to allow a break in the traffic sufficient for an animal to be removed safely from the road.

TMR will also respond and remove dead animals from major roads to prevent the carcass from becoming a hazard to motorists.

TMR also have traffic cameras on many sections of major roads. Where animals are reported on major roads, contact the TMR immediately and liaise with the TMR Operator who may be able to find the section on road on their live video feed. This is particularly useful where information received is vague and where it is unclear as to whether the animal is still alive.

We must remember that TMR's primary responsible is the safety of motorists. Rescuers must always follow the instructions of the TMR staff and stay in contact with the Operator to ensure the safety of yourself, TMR staff and motorists.

Rescuers must always wear appropriate safety equipment such as a high visibility safety vests when working on or near roads.

Right: Traffic Camera image (M1 at Worongary, Gold Coast)
Source: www.tmr.qld.gov.au

Local Council Traffic Management

Local Councils are responsible for management of traffic in their respective areas, other than those classified as 'major roads' which fall under the jurisdiction of TMR (see above).

To request assistance from Council Traffic Management Units you should contact the appropriate local Council and ask to be diverted to their Traffic Management Unit:

Gold Coast City Council	**5581 6664**
Logan City Council	**3826 5555**
Brisbane City Council	**3403 8888**
Scenic Rim Regional Council	**5540 5111**
Moreton Bay Regional Council	**3205 0555**
Sunshine Coast Regional Council	**5475 7272**
Redland Bay Council	**3829 8999**

Traffic Management units will respond where they are able, to incidents where traffic needs to be diverted on busy Council roads.

Local Council Animal Control Departments

Each Council has an animal control department that is responsible for domestic animals. They are also generally involved with the management of non-native and/or pest animals.

The contact numbers for relevant Councils are listed above under 'Local Council Traffic Management'.

Council Officers may be able to assist with the incidents involving pest animals.

Attacks on wildlife by escaped/loose domestic or wild dogs, should also be reported to Council Officers so they can ensure compliance by pet owners.

Department of Environment and Science (DES) and Queensland Parks and Wildlife Service (QPWS)

☎ **1300 130 372**

DES is the Queensland government authority responsible for many aspects of the local environment including national parks, marine parks and forests along with issues relating to fauna and flora. They are also responsible for wildlife licensing.

DES and QPWS have wildlife rangers/officers in each region. Wildlife care organisations and rescuers often need to liaise with the Rangers regarding local wildlife incidents.

It is also necessary to obtain permission from local DES/QPWS rangers to release an animal into a national park (e.g. animal in danger needing relocation to nearest safe habitat, which happens to be a NP).

Department of Agriculture and Fisheries (DAF) ☎ 13 25 23

The DAF is the Queensland government authority responsible for agriculture and fisheries. This includes biosecurity, research, animal welfare and ethics and animal health and diseases.

Wildlife rescuers may need to liaise with the DAF in relation to wildlife events including emerging animal diseases and zoonotic diseases. In these situations, it is common for DAF and DES to work closely together in matters that involve wildlife.

RSPCA Queensland ☎1300 ANIMAL or 1300 264 625

The RSPCA is Queensland's large animal welfare organisation. It is a non-profit organisation and relies primarily on donations, bequests and sponsorships to cover its expenses.

RSPCA Qld is responsible for all cruelty, neglect and abandonment complaints of companion and farm animals. In Qld, it has broadened its objectives to also include wildlife.

As mentioned previously, it is important that wildlife rescuers do not enter a property without permission by the property owner. However, some RSPCA Inspectors do have the authority to enter a property in emergency situations where an animal is at risk. It may therefore be necessary for wildlife rescuers to report incidents to Inspectors involving animals on private property where access is required.

In South-east Queensland, wildlife care organisations such as Wildcare work closely with the RSPCA Inspectors and Rescue Unit staff to coordinate the efficient rescue of sick and injured wildlife. We have formed a strong relationship for the mutual benefit of local wildlife.

Queensland Fire & Emergency Service ☎ 13QGOV or 13 74 68

The Queensland & Emergency Service can sometimes assist with the rescue of an animal that is unable to be retrieved from a height (particularly animals in trees such as critically injured koalas or birds that are entangled on a branch).

Contact can be made with the Fire Communications staff to establish whether they are able to assist; however, being an emergency response service, this is not always possible.

There are five fundamental steps involved with any rescue:

1. Initial Assessment and Planning
2. Capture
3. Restraint
4. Containment
5. Transporting

Step 1 - Initial Assessment and Planning

The first step of any rescue is to assess the situation. A well-planned rescue should result in a more efficient rescue, will minimise pain and suffering to the animal and will ensure that everyone involved in the rescue remains safe. Many of the animal captures seen these days on reality television shows are inaccurately portrayed and do not show the extent and importance of the planning and assessment phase of a rescue.

Safety

The safety of you, other rescuers and the general public is of upmost importance when planning any rescue. The organisation that coordinates a wildlife rescue is ultimately accountable for the overall safety of the rescuer. Every rescuer must be personally responsible for his/her own safety and the safety of those people around them.

One of the most basic rules of safety, when undertaking wildlife rescues, is to work in teams. Attending a rescue with another person is an important safety tool. Even if the rescue only requires one person, having another person with you in case you sustain an injury makes perfect sense. Even a simple rescue in a park or small area of bush in or near a suburban area can present varying risks. A second person is often helpful for speaking with passers-by who approach mid-rescue and for monitoring traffic.

When heading out for any rescue, even a simple one, always tell someone where you are headed and when you are expected to return. If walking in bush, make sure that you take your mobile phone with you so that you can call for help if needed. If you do proceed alone, ask the Hotline volunteer to telephone you at a certain time after the rescue, if they have not heard back from you.

When undertaking rescues at night, it is essential you tell someone where you are going. Ideally, you should take another person with you in case you find yourself in a dangerous situation. Again, if you do proceed alone, arrange to be called back by the Hotline volunteer who asked you to do the rescue. As wildlife rescuers, we are constantly meeting with strangers either in their home, at a nearby location and sometimes just on the side of a dark, deserted road. If you find yourself in a situation where you do not feel safe, do not proceed. Remain in your vehicle and telephone for help. Leave the scene quickly if you are able. If the caller is behaving erratically and you fear for your safety, do not hesitate to call the police.

Always drive safely to and from a rescue. Always obey the speed limits and all traffic regulations. It is not acceptable to risk your life or the life of other motorists by driving erratically.

Wildlife can be unpredictable. What appears to be a simple and easy rescue can quickly go wrong and impose a physical risk to both humans and the animal alike. The first step in planning a rescue is to identify all hazards. A hazard can be defined as any real or potential condition that could cause injury, death or property damage.

When assessing the safety aspects of a rescue, we need to consider the following elements:

- Environmental hazards
- Human factor hazards
- Equipment hazards
- Health risks
- Personal protective equipment

Always take a moment to assess any risks associated with a rescue and ensure that you take appropriate steps to mitigate those risks. This may include delegating tasks to bystanders (where it is safe to do so).

Environmental Hazards

A number of environmental conditions need to be considered:

- **Weather** – Bad weather such as heavy rain, high winds and/or lightning can produce hazardous conditions. Personal protective equipment such as high visibility vests and/or raincoats should be worn by rescuers. Undertaking rescues during lightning storms is highly hazardous and should not be attempted.

- **Extreme temperatures** such as high or low temperatures and humidity should be considered. Rescuers should be clothed appropriately.

- **Marine influences** – high tides or rough surf should be closely evaluated. Deep or swift moving water can also be dangerous. Only rescuers that are appropriately equipped with lifesaving training and equipment should attempt rescues in these conditions. For most volunteer rescue situations, these specialised rescues should be referred to specialised operations such as Sea World (Gold Coast).

- **Terrain** – dangerous conditions such as slippery rocks, uneven ground, deep mud or steep embankments should be assessed. Rescuers should wear appropriate footwear and should not be attempting a rescue in these conditions unless they are accompanied by another rescuer and are physically fit enough to undertake the rescue.

- **Biological hazards** – Rescuers should assess the rescue location for hazards such as harmful flora or fauna including venomous snakes, spiders, toxic plants, parasites, and other wild or domestic animals. Be aware that domestic dogs in a suburban area can pose a risk to a rescuer.

- **Technological hazards** – Man-made structures, machinery, vehicles, electricity, chemical toxins and pollutants should be identified and mitigated.

Human Factor Hazards

A number of considerations should be assessed including:

- **Suitably of the rescuers** – All rescuers should be capable of carrying out their assigned duty safely, having regard to the safety of themselves, others and the animal. They must hold the appropriate level of skill, training and experience. Rescuers should be able to evaluate themselves and acknowledge when the task is beyond their capabilities.

- **Physical capabilities** – Rescuers should not undertake duties that they are not physically capable of. Large, strong animals require a rescuer with the physical strength to be able to confidently handle and restrain them.

- **Character of rescuers** – Rescuers must be able to perform well in stressful situations, be able to take direction from more experienced rescuers, have good communication skills, be observant and be able to work together as a team. Fear, carelessness, reckless behaviour, poor judgment, impulsive actions, complacency, failure to listen or obey instructions are all characteristics which places others, and the animal, at risk.

Equipment Hazards

Wildlife rescues often involve the use of various items of equipment. Equipment can range from simple capture tools through to more complicated pieces of equipment such as flagging poles and even through to more specialised items such as firearms.

The following considerations regarding equipment should be assessed and followed:

- **Training** – Anyone using an item of equipment should be fully trained in its proper use and maintenance including any safety aspects.

- **Personal protective equipment**– Rescuers should be familiar with all available personal protective equipment and how and when to use it. They should also be familiar with the safety aspects of using such equipment as some PPE can become hazardous in certain circumstances.

- **Appropriate Licence/authority** – Rescuers should only use specialised equipment that they hold appropriate licence/authority to do so. For example, only rescuers holding a current Weapons Licence should use firearms. Only rescuers holding appropriate certification in the use of a chain saw should use same. Rescuers should not climb trees unless they hold appropriate certification and tree-climbing equipment to do so. It should be noted that Wildcare's insurance does not cover our members for tree-climbing and working at heights.

Health Risks

Volunteers must be aware that there are potential health risks associated with undertaking wildlife rescues. Most health risks can be easily mitigated by following simple guidelines including:

- **Environmental conditions** – Protect yourself from environmental conditions such as prolonged exposure to the sun and extreme temperatures which can result in dehydration, heat stroke or hypothermia.

- **Zoonotic diseases** – Some wildlife can harbour diseases which can be transmitted from animal to human. These diseases are called zoonoses or zoonotic diseases. Zoonotic diseases can be classified as either bacterial, fungal, viral, protozoal or parasitic. Detailed information about zoonotic diseases can be found in Section 4 of this Manual. Precautions should always be taken in view that the extent of potential zoonotic disease and modes of transmission from our wildlife are not fully known.

- **First Aid Kit** – All rescuers should hold a personal first aid kit.

- **Seek medical help** - Always seek medical attention if you have been bitten or scratched by a wild animal or bird. Infections from bites can cause serious conditions even if the animal does not have an active disease. It is essential that Tetanus vaccinations be considered both as a precaution and if severely bitten or scratched by any wild animal. Rabies vaccination and Department of Health protocols exist for anyone scratched or bitten by a flying-fox or microbat.

- **Venomous snakes** - Never handle any snake unless you are accredited in snake identification and handling and are confident in identifying non-venomous snakes. Training from a qualified instructor is mandatory prior to handling venomous snakes.

- **Involving children** - Do not allow children to participate in wildlife rescues.

- **Tree climbing** - Do not climb trees or onto roofs unless you have been professionally trained to do so (As noted previously, Wildcare's insurance does not cover members for climbing and working at heights).

- **Seek permission** - When attempting a rescue on private property, always seek permission from the owner before you proceed, a simple thing like removing a branch can be considered property damage.

It is imperative that wildlife rescuers understand the risks associated with handling different species. Different animals attack and defend themselves in different ways. Make sure that you are familiar with the natural history and behaviour of each species before attempting a rescue.

Assessment of the animal prior to capture:

Before attempting to capture any animal, it is essential you attempt to establish the animal's level of mobility. Injured wildlife will exhibit varying degrees of mobility from those that are only slightly injured and that are still able to escape or defend themselves, through to those that are either unconscious or completely unresponsive. Do not allow an animal's lack of mobility or response cause you to let your guard down. Treat every animal, no matter what the injury or condition, as dangerous.

Once you have made an assessment of the animal's mobility, you can then prepare your equipment. You may find that you will need to call for additional help if you feel the capture is outside your capabilities. It may be necessary to coordinate more rescuers and possibly a different approach.

Assessing the animals' ability to move can be undertaken by:

- Observing the animal briefly in situ – is it moving around or attempting to move around?
- Ask the caller for a history of the animal (hopefully you obtained this on your way to the rescue) – have they seen the animal move and if so, how active was it or how was it moving?

Where you are assessing larger animals at a distance or animals in a tree, a good pair of binoculars is handy to have in your kit.

Once you have made a brief assessment of the animal's mobility, you can then proceed to plan the actual capture. Even though it is important to observe how an animal moves prior to capture to confirm injuries and that a rescue is necessary, sometimes you may not get an opportunity to do this assessment (i.e. where the animal is in danger of further injury). You should not risk the animal evading capture, or moving beyond what is currently a reasonable capture, by taking unnecessary time to do this assessment. If this is the case, another opportunity to observe movement may be possible at the wildlife hospital, prior to the animal's anaesthesia for its veterinary assessment.

Planning the Rescue

Before attempting to capture the animal, take a moment and assess the situation thoroughly. Take into consideration the information that you have gathered relating to the animal's mobility. Remember that animals with injuries that would render humans immobile, are often still able to move quite well simply because of fear and stress.

When planning a rescue involving a number of volunteers, it is usual practice for the most experienced rescuer to be placed 'in charge' of the rescue.

This person should be responsible for making the assessment of the rescue, identifying potential hazards to both the rescuers, bystanders and the animal. It is their duty to brief everyone involved so that each person knows their role. The person in charge should ensure that hazards are identified, and the risks mitigated, that all team members have appropriate PPE (if required) and will clarify the expectations of each rescuer.

Having an experienced rescuer in charge is imperative in dangerous rescue situations involving adult macropods or arboreal animals in a tree.

When planning a rescue, you have to try to outthink the animal. In many cases, it is unlikely that you will be able to outrun the animal and attempting to do so, may result in injury.

Assess the area where the animal is located and try to 'herd' or gently encourage the animal into a cornered yard or towards a fence or upward embankment. Identify any possible threats to the animal including roads, pools, ponds, dams, barbed wire fences, and keep the animal away from those areas. In some situations, it is necessary to have other volunteers strategically placed in an attempt to keep the animal away from potential hazards. If the animal is in a yard, make sure the gates are closed and securely latched.

Where an animal is still active, make sure you have enough rescuers to and allow for alternative options should the animal move in an unpredictable manner.

It is often necessary to ask bystanders to move away from the area. Make sure that all children are moved away for their safety. Ensure any domestic dogs and cats are removed and are out of sight. If they are placed indoors, ask the resident to draw the curtains/blinds so that the animal cannot see out. A barking dog will still influence the animal's behaviour, even if the dog is behind a windowpane.

Able-bodied and sensible adults can often assist with rescues by standing guard near hazards or asking them to carry the transport cage to you once you have captured the animal.

As a wildlife rescuer, we should never place a bystander at risk and given that we live in a very litigious society it is important that we always consider the liability aspect if a bystander were to be injured when assisting with a rescue.

Photos: Echidna trapped in a stone wall. The rescue was coordinated by an experienced echidna carer with the local fire fighters and a local veterinarian.
Photos: Deborah Turnbull

Whilst most wildlife rescues are fairly straight forward and in fact, many simply involve collecting an animal that is already contained, it is important that you are confident to handle a variety of situations where the animal is not as yet captured. Even if the animal is well contained, it is often necessary for you to move the animal into a more secure transport carrier or cage once you get to a vet or home.

Select your equipment

For simple rescues where the animal has limited mobility, you will generally only need minimal equipment such as:

- Towels or a small blanket (depending upon the species); and/or
- Cotton pillowcase (depending upon the species); and
- Gloves (type dependent upon the species being captured); and
- Capture net (if required)

For difficult rescues involving more dangerous species or scenarios, you may also need to have other specialised equipment as outlined in the Rescue Equipment (Advanced) previously.

Chemical Immobilisation

There are some situations where the chemical immobilisation of the animal is the most humane and safest method of capturing an animal. Adult macropods are one species that are commonly immobilised using an injectable anaesthetic. The anaesthetic is administered through direct injection by hand once the animal has been securely captured and restrained or alternatively, can be administered by a blow dart or tranquiliser gun. Some echidna rescues are also best done if the animal is chemically restrained first (e.g. echidna with trauma injuries that has burrowed under a fence).

Chemical immobilisation is a specialised area of rescue, requiring special permitting and training and is beyond the scope of this training manual.

The capture process

The main purpose of capturing a rescued animal is to transfer it into a secure transport carrier quickly and efficiently. Having a well-planned and executed rescue will reduce stress and pain and the likelihood of injury to the rescuer.

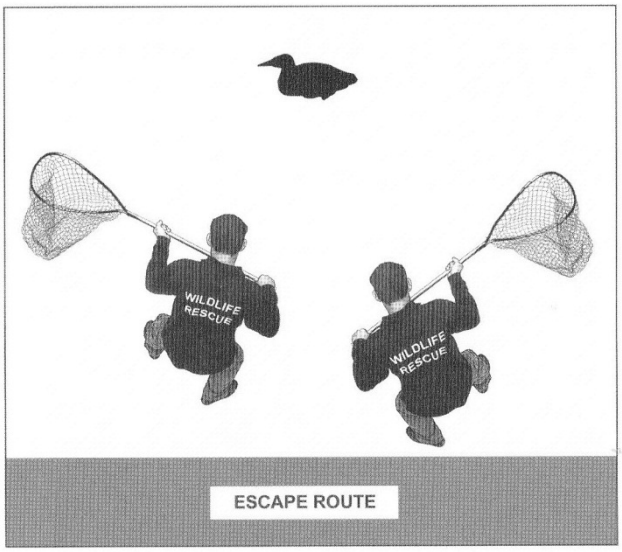
An important part of the capture process is understanding the animal's usual method of movement. For example, a bird species that generally flies straight up into the air will need a different capture method from a species that must scuttle across the ground to become airborne.

Another important aspect of the capture process is being able to predict the animal's direction of flight/run. Most wild animals will try to move away from the threat (which in a rescue situation will be from us). If they are cornered and have no way of moving away from the threat, then they are more likely to attempt to defend themselves. If they are able to move away, they will generally try to move away from the threat and towards safety. Again, understanding the species natural history will help you understand what they consider to be their 'safety zone'.

Take for example:

- **A water or sea bird** - their safety is returning to the water
- **Arboreal species** (e.g. koalas, possums) - their safety is to climb a tree
- **Snake** – their safety is to hide under something
- **Echidna** – their safety is to burrow down
- **Macropods** – their safety is to find cover (such as long grass/bush)

Once we understand this concept, the actual pursuit and capture of an injured animal will be more successful. Often wildlife will still attempt to follow the path to their 'safety zone'. When approaching an animal, approach it from its potential escape route. For example, for a water bird, position yourself between the bird and the water.

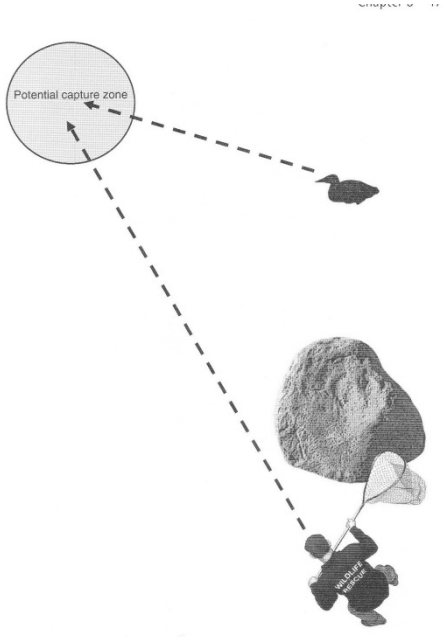


As a general rule, try to position yourself between the animal and its route of escape.

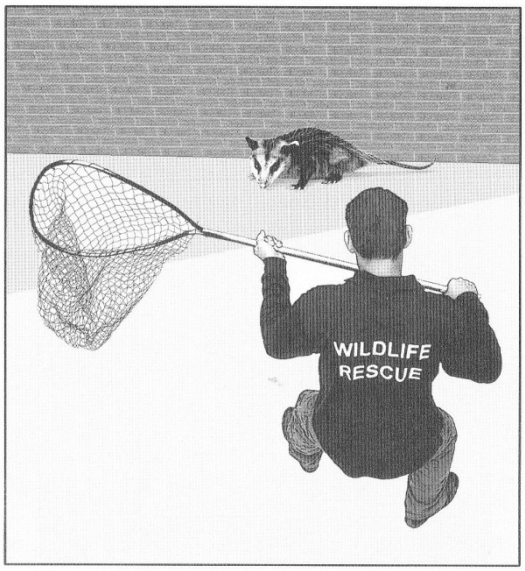
Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)

Try to keep yourself out of the animal's vision as much as possible. Remember, if you can see the animal then it can most likely see you also. Try to sneak up on the animal – use features in the environment to conceal yourself (such as bushes/shrubs, fences etc).

Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)



You need to try to herd or move the animal into a more suitable location which will increase the chances of a successful capture and will minimise risk to the animal and rescuers. Use structures such as walls, fences or upward embankments to your advantage. When attempting to move an animal into another location, only apply a minimal amount of pressure on the animal. Some animals will start to move away from you when they first see you whereas others may need more pressure applied such as waving your arms or moving towards them more assertively.



Use barriers such as walls, fences to help corner an animal to assist in capture.

Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)

Wildlife will generally be more threatened by two or more people advancing towards them from opposing directions compared to if they were to approach from the same direction.

Complicated rescues may take some time to accomplish. In some situations, it may be necessary to move very slowly towards an animal over 5-30 minutes. During this period, the animal may become accustomed to you being there and may not perceive you as great a threat. This is particularly useful in situations where wildlife is in an area where there is a lot of human traffic (such as public parks, golf courses etc). In these situations, try to blend into the crowd by paying attention to what you are wearing.

When approaching wildlife, try not to look intently at them. For large species, such as adult macropods, avoid direct eye contact as they are more likely to feel threatened and defend themselves more aggressively.

Wildlife, when approached will be very aware of the slightest movements. When using equipment such as nets, try to keep the net concealed as much as possible. Hold it to the side of your body opposite to where the animal is situated. Hold the bag of the net with the handle to prevent it from blowing in the wind or dragging on the ground. When two people are approaching an animal, try to keep the net concealed behind the person in front. If it is a windy day, secure long hair. Try not to wear bright contrasting clothing or billowing outerwear, particularly not clothing material that makes a noise.

Immediately upon your commencing to capture the animal, you must not hesitate – you must give it your all. Even a split-second hesitation can result in the capture being unsuccessful.

At the moment of capture, aim to intercept the animal where you predict it will be – not where it currently is resting. In rare circumstances, the animal may be stunned enough that it does not move and may try to defend itself rather than try to flee.

Key

The following capture methods have been rated to indicate the degree of difficulty and the level of experience and equipment that you would require to undertake such rescues.

Easy ★
Suitable for new rescuers, limited equipment needed.

Not so easy ★★
Suitable for rescuers with some experience and/or equipment.

Difficult ★★★
Suitable for more experienced rescuers with specialised equipment.

Dangerous ★★★★
Suitable only for experience rescuers with specialised training, equipment and training.

Capturing Birds

Towel Method ★

If the bird is mostly immobile and you are confident that you will be able to capture it without the use of a net, then you can simply use the towel method. For smaller birds, you may be confident to not use a towel, however the towel helps reduce stress on the bird's part as you can cover its head in the capture process and thereby reduce visual stimulation.

Using a towel, cover the head and body of the animal. Use one hand to secure the back of the head and the other to secure the body. For more details on correct restraint methods, refer to Restraint for various bird species in the following section. The main consideration is visible injuries – your restraint and handling of the bird may need to be modified based on what the injuries the bird has sustained.

For very small species of birds, use a tea towel in lieu of a towel.

Net Method ★★

If the bird is still mobile to some degree, it is beneficial to use a net to capture it.

The weight, length and mesh size of the net must be appropriate to the bird being captured. Birds are generally lightweight and delicate and using a heavy net could cause further injury.

Remember to hold the net down low as inconspicuously as possible when approaching the bird. Keep the net down to your side, not waving it around in the air. Hold the net in your strongest hand to ensure a more efficient and successful capture.

If the bird is still able to fly (or even able to still flutter around), the swing should come from above. Carry through with the net so that the hoop lies flat on the ground to prevent the bird from escaping.

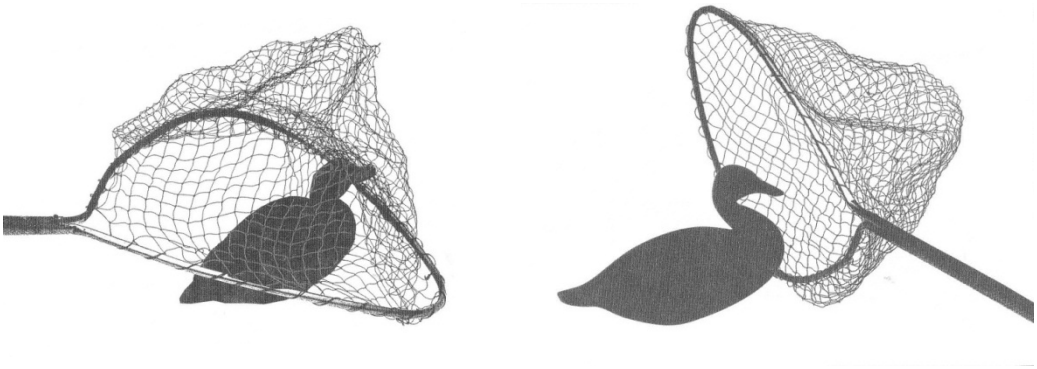
For birds that are not flighted, you can use a side swing motion with the hoop of the net immediately in front of them. Remember that birds will try to flee forwards towards safety. Follow through quickly and ensure that the hoop lies flat on the ground to prevent escape.

Once you have the bird in the net, place a towel over the bird to reduce visual stimulation and reduce stress. Gently, place a small amount of pressure on the bird's back to gently 'pin' it to the ground. This will stop the bird flapping around in the net and reduce the likelihood that it

will get entangled in the netting material. This also allows you to remove the bird safely from the net and place it into an appropriate transport carrier.

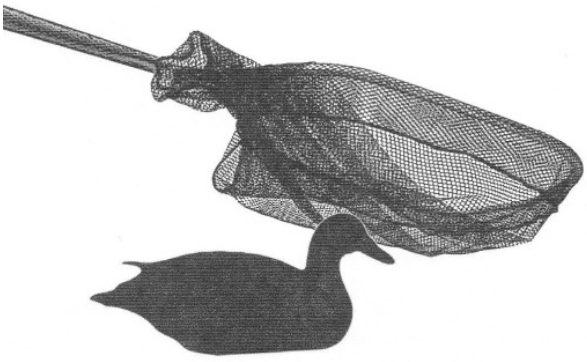
Where the bird is fluttering against a window, place the net gently over the bird and keep the hoop as flat against the surface of the window as possible. Often the bird will fall into the bag of the net. If the bird is able to be reached easily, secure the bird in the netting before bringing the net down. If the bird is beyond reach, when you start to bring the net down you can try to twirl or twist the bag of the net to prevent the bird from escaping.

Handy Hint: Sometimes birds will grip very tightly with their feet upon capture. A small twig can be put into its grasp to avoid your finger getting caught. Similarly, if the animal is attempting to bite or peck at you, try to get the towel between your hand and the bird's beak, although wearing gloves alleviates this too.



Diagrams Above: When netting a flighted or mobile bird, the swing should come from above (left). When netting a non-flighted, the swing should come from in front of the bird (right).

Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)



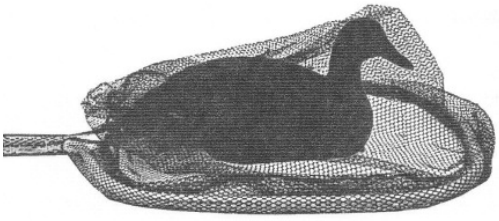


Diagram Left: Always remember to follow through with your swing so that the hoop of the net lies flat on the ground. This reduces the chance of the animal escaping.

Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)

Lures/Snares

★★★

Birds that are still fully flighted require more advanced rescue techniques and often need to be lured with food. These birds are difficult to catch although not impossible. It takes patience and perseverance. Luring birds with food is a common necessity with water and sea birds where they have become entangled in fishing tackle but are still able to move.

Some birds may be able to be lured with food into an area by one rescuer while another rescuer hides nearby with a net. Once the bird takes the food, the other rescuer may be able to quickly net the bird.

Another option is to use a snare where a piece of fishing line is placed in a circle and the end held by a rescuer. The bird is lured into the capture zone with food and then the line is pulled to capture the bird's foot. The bird can then be netted or captured by hand by an experienced rescuer. Pelican rescues involve a special technique of luring with food and then capturing by hand and should only be attempted by a trained pelican rescuer or under the direct supervision of one.

Catching fully flighted birds is a specialised rescue technique. Inexperienced rescuers should always seek assistance and advice from experienced bird rescuers before attempting any of these techniques. Often these birds are very shy and making fumble attempts to capture it can make it wary of people and can severely reduce its likelihood of being captured by a more experienced rescuer.

There are specialised wildlife rescue organisations in many parts of Australia that specialise in the capture of sea and water birds, which are the species most likely needing capture. They are also available to help with other bird species that are fully flighted. Rescue situations such as these, should be referred to an experienced wildlife organisation or rehabilitator with the skills and equipment to achieve a successful rescue.

The rescue of flighted injured birds requires specialised techniques ... and a lot of patience! The photo on the top left shows a rescuer waiting for a pelican to step into a snare (picture bottom left). The snare contains fishing line in a circle that is attached to a section of fishing pole. Once the bird is within the capture area, the pole is pulled quickly snaring the bird. Another rescuer then quickly secures the bird.

Photos courtesy of Pelican and Seabird Rescue.
https://www.facebook.com/PelicanRescue/
Telephone: 0404 118 301
24 hour rescue hotline
Pelican and Seabird Rescue run specialised rescue training workshops in these techniques.

Capturing Mammals

Towel Method ★

If the mammal is mostly immobile and you are confident that you will be able to capture it without the use of a net, then you can use a towel or small blanket method. For smaller mammals, you may be confident enough to simply use a pair of gloves although using a towel does help to reduce stress as you can cover its head in the capture process and thereby reduce visual stimulation.

Using a towel, place the towel over the head and body of the animal. Use one hand to secure the back of the head and the other to secure the body. For more details on correct restraint methods, refer to Restraint for various mammal species in the following section. Again, the main consideration is visible injuries – your restraint and handling of the mammal may need to be modified based on what injuries are present (e.g. avoid holding animal by the tail if it appears to have a spinal injury).

Net Method ★★

The capture of mammals varies considerably due to the huge size difference between our Australian mammals. The methods used to capture a small glider will be significantly different to the method used to capture an adult macropod.

When capturing small to medium mammals the use of a net is useful, particularly when you are still learning about the various species, learning to read their body language and understanding their natural history.

When approaching a mammal, use the same method as when capturing birds. Keep a low profile, ensuring that the net is kept low. Extend the net beyond the animal's head and try to anticipate the direction that it may take and the speed at which it might try to flee. Remember, arboreal mammals will usually try to flee towards a tree. Try to bring the net down so that the centre of the net is at the head of the animal.

Once captured, quickly ensure that the hoop is lowered to the ground to prevent the animal from escaping. To reduce stress, place a towel over the animal in the net to reduce stress. You can then gently 'pin' the animal to the ground. This helps to stop the animal from struggling and can prevent further injury and stress. This also gives you an opportunity to safely remove the animal from the net and transfer it into an appropriate transport carrier.

Large mammals – Koalas ★★★★

Adult koalas in South-east Queensland range in size from around 4.5kg through to 10kg (males).

They can be extremely aggressive, particularly after being mauled by a dog and are very strong animals. Often finders will report that the koala appears tame and placid, that they could even approach and pat it, but once restrained they can become agitated and aggressive. Only wildlife rescuers that have been specifically trained in rescuing koalas should attempt a koala rescue. Often the koala is still in a tree and specialised equipment and rescue methods are required.

However, if the koala is badly injured or very weak on the ground, the koala can be captured by covering the koala with a thick blanket ensuring that the blanket reaches over the head and is large enough to wrap around the koala.

Once covered, secure the arms (between the shoulder and elbow) and gently pick up by the arms and place into a secure rescue cage.

Large Mammals – Adult Macropods (kangaroos, wallabies and pademelons)

★★★★

Rescue calls relating to macropods are generally as a result of trauma-related injuries such as being hit by a car. Adult macropods, particularly large kangaroos and wallabies can inflict serious damage to rescuers if they are not confident in handling them. Most adult macropods need to be sedated at the rescue scene so that they can be handled and transported.

Adult macropods that have sustained fractured legs will usually defend themselves aggressively and most are still able to hop away even on exposed bone. These animals can cause serious damage to yourself and bystanders and are not an animal that you should attempt to rescue if you are inexperienced.

All rescue calls relating to adult macropods are referred to Trauma Carers who are appropriately licensed by Queensland Health to hold and use veterinary drugs for the purpose of sedating and euthanising critically injured wildlife.

However, some smaller macropods, which are immobile and largely unresponsive, can be captured by grasping the base of the tail very firmly. Smaller/younger species can be lifted off the ground (provided you are physically capable of doing so), keeping the hind legs pointed away your body to prevent them kicking you. Large wallaby bags made from heavy duty canvas (approximately 1m x 1m in size) can be used to secure the wallaby in. Use a 'bungee ball' or Cable Clamp to secure the open end of the bag.

Capturing Echidnas

★★

Although echidnas will not be able to outrun you, they are extremely strong animals and if they have burrowed into the ground, particularly around tree roots, they can be difficult to extract.

Echidnas will often avoid capture by digging themselves into the soil or other tight spots. It is very difficult to remove them without digging them out physically. Digging should be far enough from the animal to avoid further damage to limbs, snout or other body parts.

Use leather 'rigger-style' gloves or welding gloves.

Never use a shovel (or another tool) to dig the echidna out. To remove the echidna, the hole needs to be dug to allow the rescuer access to the underbelly of the echidna. To remove the echidna, place a hand just behind the forelimbs on the underbelly. The echidna will tend to curl around the hand, creating a secure hold. Sometimes, the more you dig to free the echidna, the more the echidna manages to burrow in! In extreme circumstances, where the echidna has injuries but has dug itself deep into the ground, a Trauma Carer may be required to administer a sedative to safely retrieve the echidna.

If the echidna is not buried into the ground, you can work your hands into the side of the body between their forearms and hind limbs and slowly inch your fingers in until they are under the belly. They can then be picked up and rolled into a ball. If you do not have gloves, you can try using a thick towel folded over.

Capturing Bats

★★★★

Only wildlife rescuers that have been vaccinated against Australian Bat Lyssavirus should attempt the capture of any bat. Both micro and mega bat species in Australian have been known to carry Lyssavirus.

The capture of microbats is best achieved wearing a pair of thin flexible leather gloves. The use of thick leather gloves will restrict your dexterity and may reduce your ability to hold the bat securely. Wearing gloves is an essential form of protection when handling any bat species, including small microbats.

Megabats can be captured by wearing leather gloves and using a folded thick towel. The towel should be wrapped around the bat, starting at the back and encasing the wings against the body. The head can then be secured from the back and the feet secured by gripping onto the towel.

The rescue and handling of bats is a specialised technique and should only be undertaken by wildlife rescuers that are appropriately vaccinated and who have undergone specialised training with an experienced bat rescuer.

If you are interested in rescuing bats, Wildcare recommends that you join a dedicated bat group. There are several groups in South-east Queensland which offer comprehensive training in the rescue and care of bats, including:

Bats Qld (Flying Foxes and Microbats Inc) - https://www.batsqld.org.au/
Bat Conservation and Rescue Qld Inc - https://bats.org.au/
Bats Rescue Inc. - https://batrescue.org.au/

Capturing Reptiles

Up to ★★★★ (dependent on species)

Small to medium reptiles can be captured using a pair of gloves suitable to the size and species of the animal. Suitable gloves include leather 'rigger-style' gloves or welding gloves (for larger species).

Small to medium lizards can also be captured using the towel or net method in the same manner that a small to medium mammal would be captured.

Non-venomous snakes should be captured using specific reptile rescue/handling equipment such as a snake hook and snake bag. Critically injured small to medium non-venomous snakes can be captured by hand with or without the use of gloves or a towel.

No rescuer should attempt the rescue of a snake unless they are 100% POSITIVE that it has been identified as non-venomous. Wildlife rescuers will generally only rescue common species of non-venomous snakes such as Carpet Pythons and Green Tree Snakes. The rescue of venomous snakes should only be undertaken by wildlife rescuers who have undergone intensive training by a qualified instructor in the identification and handling of these species.

The rescue of snakes is a specialised field and should only be attempted by wildlife rescuers that have completed an appropriate reptile handling course and who have been endorsed by the Wildcare President as being competent to attend such rescues.

Reference should be made to the Wildcare Safety Management Manual with regards to the rescue of snakes.

Capturing Amphibians

★

Sick and injured frogs are generally already contained when they are collected by wildlife rescuers. There is very little health or injury risk to a rescuer when handling or capturing Australian amphibians, with the exception of Cane Toads which are toxic.

Always wash your hands before capturing a frog and where possible, wear a pair non-powdered hypoallergenic gloves disposable gloves when handling.

The main risk when capturing frogs is that they are unpredictable and can easily jump from your hand and risk further injury.

Transferring animals from nets

If you use the net method to capture an animal, you will then need to transfer it safely and efficiently from the net to an appropriate transport carrier.

Once the animal is secured in the net, immediately place a towel or lightweight sheet over the animal to reduce visual stimulus.

Place pressure on the animal from the top to gently push it to the ground. Remember, this is gentle pressure – sufficient to restrain and keep the animal from escaping. For birds, keep the wings folded in their normal position. For mammals and reptiles, secure around the back of the head/neck and around the tail.

Once secured through the towel and netting, another rescuer can work their hands under the net to secure the head and tail/legs. Once the second handler has control of the animal, the net can be lifted away, and a lightweight towel can be placed over the animal's head in an effort to reduce stress.

For smaller animals, this process can be undertaken by the same rescuer. Using one hand to secure the animal from above the net and then the second hand is used to secure from beneath.

During this process, try to keep the net low to the ground to prevent the animal escaping in case you lose your grip.

To place into a box or transport carrier, the door or sides of the box should be held as closed as possible against your arm or body as the animal is placed inside. This helps to reduce the likelihood of the animal escaping.

Another method of transferring a small animal or bird from a net to a carrier is to first secure the animal in the net by gathering the fabric of the hoop between the opening of the net and the bird. The animal will then be secured between the bottom of the hoop and your hand. You can then carefully and firmly place the opening of the net flat against the door of a transport carrier/cage and then release your hand and allow the animal to make its own way from the net to the carrier/cage.

Transferring animals from boxes/carriers

It will often be necessary to transfer an animal from a box or carrier and into a more appropriate or permanent carrier/cage.

Remove all furnishings in the cage before transferring (such as food/water containers, branches etc).

To transfer the animal, use a towel (size dependent upon the size of the animal) and cover the entire animal. Gently push the animal to the ground or into a corner so that you can obtain an appropriate grip (refer to section on restraint) and then lift out.

Note:

Always transfer animals from nets and boxes/carriers in an enclosed area to prevent complete escape should they get away from you.

Being confident in restraining common species of wildlife is an essential skill for all wildlife rescuers and rehabilitators. Correct restraint methods will minimise unnecessary stress, reduce pain and reduce the likelihood of further injury to the animal.

Appropriate restraint of wildlife is necessary in a wide variety of situations including:

- The actual capture and containment of the animal
- Transferring a captured animal from a net, cage or trap into an appropriate transport carrier
- Transferring an animal from a transport carrier into a suitable cage or aviary
- Undertaking a thorough physical assessment of the animal to identify injuries and conditions
- Medicating wildlife during its rehabilitation
- Weighing the animal after rescue and during its rehabilitation
- Capturing from holding cages and aviaries so that they can be transported for veterinary care and release

The secret to wildlife restraint is to handle the animal confidently enough to prevent it from struggling but gently enough so that it does not cause unnecessary stress or harm. Incorrect restraint can have detrimental effects upon the animal. If handled roughly, most wild animals will respond aggressively and are more likely to attempt to bite, kick or scratch. This also makes their ongoing rehabilitation difficult as they are unlikely to settle into care and do not make good patients.

Make sure to use appropriate personal protective equipment (PPE) when handling the animal (if appropriate) as well as appropriate equipment to aid in the restraint of the animal. For example, when restraining snakes, the use of specialised snake handling equipment can make the restraint process much less stressful and reduce the likelihood of the handler being bitten.

Personal hygiene is also very important when restraining wildlife. Reducing your exposure to zoonotic diseases and reducing the risk of cross infection between animals in important. Equally important is making sure that your hands or clothes do not smell like a predator species when you restrain an animal. For example, if you have just been handling a small mammal such as possum or glider, don't then attempt to restrain a snake without first making sure that you have thoroughly washed your hands and even changed your clothes.

During the restraint process, you must ensure that you are attuned to how the animal is responding. You must constantly assess the animal for signs of stress and/or discomfort. Prolonged restraint of some species can lead to life-threatening conditions such as capture myopathy or hyperthermia (over heating). In contrast, prolonged restraint and exposure of small young animals away from a heat source (such as orphaned joeys and baby birds) can lead to hypothermia (getting cold).

If you are not confident with dealing with any species including animals such as adult koalas, venomous snakes, lace monitors and bats, you should NEVER attempt to handle the animal and you should seek assistance from an experienced wildlife rescuer.

When restraining any animal, it is best to firstly secure it in a towel or a pillowcase. When picking up the pillowcase, ensure you support the animal's full body weight. For example, do not pick up an animal just by the forearms or wings.

Once the animal is restrained in a towel or pillowcase it is important that you restrain the "dangerous" parts of the animal. In most species, this will mean restraining the head and feet/claws. Gently hold the back of the head with one hand with your thumb on one side and your third and fourth fingers on the other. Use your index finger to place on top of the head for additional control.

Below is a summary of restraint methods for each species of common wildlife that you may encounter and allows you to feel the direction in which the animal is turning.

For more detailed photographs of correct handling/restraint methods refer to Species Information Sheets.

Tawny Frogmouth
Credit: Lee Pirini

Reptiles

Lizards

Lizards are capable of defending themselves using their mouth/teeth, claws, tail or a combination of all these.

The capture and restraint of lizards will require quick reflexes and confidence. Lizards are mostly shy by nature and will generally try to hide away under a towel in a cage. This natural behaviour can be used to your advantage when attempting to capture and restrain them. Once restrained, they may try to wiggle themselves free so maintaining a firm but gentle hold is equally important.

Water Dragons and Bearded Dragons

They have spiky, rough skin (particularly Water Dragons) so use a towel or gloves to protect your hands. They may also try to bite.

Use one hand to distract the lizard and get its attention. Use your other hand to gently, firmly and swiftly grab the lizard around the back of the head. For strong or large species, gently push the lizard to the ground. This will give you a better grip before picking it up. With one hand securing the animal around the back of the head, restrain the back of the lizard by grasping either just before the hind legs or by grasping around the base of the tail with their hind legs secured in the same hand.

Keep the dragon off the ground/table. If placed on a surface they will continually try to get away so keep elevated where possible.

Dragons can be unpredictable. If you are called upon to rescue an injured dragon, it may appear quite docile and lethargic. Always assess its level of alertness before attempting restraint as once warmed up and feeling better their demeanour can change dramatically.

Correct methods of restraining Water or Bearded Dragons.

Credit: Karen Scott and Kristie Remmert

Skinks, legless lizards and geckoes

These species can lose or drop their tails quite easily so always handle above the tail region.

Restrain the head with your thumb and/or index finger around the neck and support their body with your other hand.

For smaller species, you can rest the body in your curled hand with your thumb placed gently on the top of the head to restrain it.

Correct restraint of Legless Lizard (top left) and Blue-tongue skink (top right)

Credit: Karen Scott

Goannas / Lace Monitors

Goannas/Lace Monitors have very sharp teeth, claws and a tail that whips (hard).

They are now classified as a venomous animal (although they lack a sophisticated delivery system like a snake).

Larger individuals will generally require an experienced reptile handler depending upon its condition/demeanour. Two people should always be present when capturing or restraining large monitors. The use of welding gloves is recommended.

To restrain, hold the neck firmly (but gently) with one hand. With the other hand, hold the hind legs together making sure that the body is facing away from your body. You can control the tail by placing it either between your legs or holding the tip of the tail in the hand that is restraining the hind legs.

For active monitors once restrained, you can wrap towels around the body to further restrain the legs and prevent scratching from claws.

Again, keep the animal elevated, as placing it on a table will result in it trying to get away and increases your risk of being injured.

Credit: Karen Scott

Freshwater Turtles

Turtles can bite and scratch with their claws and will actively try to escape. You may choose to use a towel or a pair of gloves, particularly for larger individuals.

To restrain smaller species, grip the rear of the shell with your thumb on top and fingers underneath.

For larger species, grip both your hands on either edge of the carapace between the front legs and in front of the hind legs. For turtles with trauma resulting in carapace damage, also try to hold the carapace in a way that best supports it, to avoid further damage.

Correct restraint of freshwater turtles.
Credit: Kristie Remmert

Amphibians

Always wear moistened, disposable, non-powdered hypoallergenic gloves when handling frogs. Amphibians have fragile skin so keep handling to an absolute minimum.

When handling, place one hand around the pectoral girdle behind the front limbs and the other beneath the hind limbs. Restrain the frog by enclosing it in your grasp without squeezing.

For larger frogs and for a more secure grip, you can use the thigh holding method where you grasp just above the knee joint and gently pull the limbs back. Do not attempt this technique if you suspect injuries to the hind legs.

For jumpy individuals that are difficult to hold onto, you can use a damp paper towel to assist with handling.

Small/active species can be examined in a clear, rinsed, chemical free container.

Correct restraint of a Green Tree Frog.

Credit: CWS

Snakes – Non-venomous

A snake's main method of defence is to bite. Some species such as pythons will also use constriction as a defence mechanism so be careful when handling them. Snakes will also often defecate when being restrained. Green Tree snakes release a pungent chemical upon restraint. This is not harmful, but you will smell it for hours later, especially if it gets on your clothes or hands.

Snakes have backward facing teeth so if you are bitten do not attempt to pull the snake off. To remove, gently squeeze together the corners of its mouth or place some liquid soap in their mouth. If you are not successful, gently push the head forward to release (not backwards) to avoid further damage to yourself and the snake.

Handling snakes should be minimised (or avoided if possible) if they have just eaten. This reduces the likelihood of them regurgitating which is unpleasant for them and you. If their eyes are opaque (which indicates that they are going to shed their skin), they are likely to be more aggressive.

You should never attempt to restrain or handle a snake if you do not know what species it is. Always assume that it is venomous unless you are advised otherwise by an experienced snake handler.

Common snake handling equipment used when capturing and restraining a snake includes specially designed plastic tubes (that are pliable and clear) and a snake pinner. A pinning tool enables the head to be safely secured. It applies pressure from above with its soft, flexible rubber tubing suspended from a U-shaped tong. Once the head is gently pinned to the ground, you can proceed to get a grip of the head.

Snakes over 1.5 metres long should be handled by two confident reptile handlers. Snakes this large are considerably heavy in weight. One person will restrain the head and the other will support the body weight. This is also a safety precaution in case the snake was to wrap itself around one of the handlers, in which event the snake should be unwound from the tail end first.

Capturing and restraining a snake will require quick reflexes and confidence. Use a snake pinner if you are not confident with restraining.

Use one hand to distract the snake and get its attention. Use your other hand to gently, firmly and swiftly grab the snake from behind its head, then grab its body with the other hand.

Alternatively, throw a towel, tea towel or pillowcase over the snake's head to aid viewing its movements and allow it (and yourself) to calm down before gently, firmly and swiftly grabbing it around the head. This method can however increase the chance of being bitten as you do cannot get as good a grasp on the snake or the snake may move its head and you may grab the towel only, leaving the possibility of being bitten.

Once restrained, you can reposition your grip so that your fingers are on top of the head and your thumb and little finger underneath. Alternatively, you can hold the neck behind the angle of the jaw.

Large, gentle individuals can be held gently around the neck (just below the head so as to be out of reach of the jaw). It can then gently support itself by coiling around your arm.

Always hold snakes gently with a relaxed grip. The tighter you squeeze the more stressed they will become. A relaxed grip will impart the message that you don't want to hurt them and allow them to settle down.

Refer to the Wildcare Safety Management Manual for more information regarding the rescue of snakes.

Snakes – Non-venomous (continued)

Above: Restraint methods for small Green Tree Snake (top left) and large python (top right).
Credit: Kristie Remmert and AZWH

Snakes – Venomous

Working with venomous snakes can expose you to potentially life-threatening situations. They should only be handled by experienced and licensed snake handlers.

Venomous snake handlers have specific methods that they utilise to get the snake to crawl into a similar sized tube and securing their body once they are part way advanced.

Handling venomous snakes will not be covered into this training manual.

Credit: AZWH

Birds

Many birds are capable of defending themselves using either their beak, claws, wings or a combination of these. They also easily suffer from stress. To minimise stress, all birds should be caught quickly and efficiently, and they should only be restrained for as short a period of time as possible.

When handling, care should be taken to avoid restricting sternal movement as birds do not have a diaphragm and rely solely on the movement of their ribcage for inhalation.

It is also essential that any handling/restraint method prevents damage to their flight and tail feathers as this may impact on their ability to regulate their temperature and reduce their capacity to fly.

Always remove birds from a cage or carrier in an enclosed room in case of escape.

Use a net when capturing birds from aviaries. Nets for birds should ideally have a padded ring and the hoop material should be fine enough so that feathers and limbs will not get entangled.

Other equipment used for restraining birds include towels, gloves and eye protection (goggles).

Small sized birds

Small birds can be handled by gently cradling them in your hand, using a V-grip or for more protection extend your fore and middle finger against the side of their neck/jaw area. Be extra careful handling around the chest as too tight a grip can be fatal.

If you need to use something to capture and restrain them, use a cotton tea towel (do not use material with loops such as terry towelling as their claws can easily get caught).

Most small birds have very sharp claws that can dig into your fingers and can be difficult to extract.

Credit: AZWH

Medium sized birds

They come in a range of shapes and sizes and each have their own method of defence. Observe the bird first to see what the dangers are and what parts need to be immobilised first.

To capture it is best to direct into a corner and then place a towel over the head enabling you to reach in and grab it from behind. Hold the bird with your thumb and middle finger on either side of the bird's head and the index finger placed on top of the head. Keep the bird at arm's length whilst holding your other hand around the wings with the feet secured between your fingers.

Credit: CWS

Pigeons

Pigeons can stress moult when being restrained and can be quite erratic when startled or first caught. Approach quietly and quickly grasp around the body securing the wings. Alternatively cover with a towel first to help contain the wings. To handle, keep the wings restrained and allow the bird to rest in your hand with the feet held between the first and second fingers. Always maintain a firm yet gentle grip as they can suddenly try to escape.

Parrots

Capturing a parrot will require quick reflexes and confidence. This can be daunting to begin with, and the use of a thick towel is recommended.

To capture, either herd into a corner or wait for the bird to turn and then place a towel over it carefully and gently push it onto the ground or into the corner.

Gloves are not recommended, especially with the smaller parrot species, as they restrict your ability to judge the tightness of your grip. Their beak can inflict a nasty bite and their claws can latch on. Handling requires a firm but gentle grasp from behind the head. Then using your forefinger and thumb push the beak upwards, restricting the ability to bite.

For smaller species a tea towel can be used and the neck of the bird can be held between the middle and index fingers whilst the body is cupped in the other hand.

Credit: CWS

Raptors

Raptors can inflict painful bites, but their talons can do more damage, so they must be properly restrained at all times. Once restrained, keep your hands low to protect your face.

Larger species of raptors should only be handled by experienced raptor handlers.

To restrain, place a thick towel over the bird and carefully push the bird onto the ground or into the corner. You need to establish if you have the bird on its back or front; raptors can lie on their back and be quite defensive with their talons. If they are on their back, use a rolled-up towel to allow them to hold onto it with their talons, and then try to flip the bird over.

If standing up, grasp from behind with both hands, using a towel. Position your thumb and first two fingers so that they are holding the wings and the towel. Work down the body from behind so it cannot reach you with its talons and gently grab the legs, placing a finger in between to prevent them crossing their legs over and wounding themselves with their talons. Bring the bird up to a position where its back is resting on your rib cage, keeping the beak away from your face. The other arm and hand can restrain the wings and then the towel can be dropped. This technique is not always possible with larger species, and an experienced handler is required in this situation.

Credit: CWS

Sea and Water Birds

To capture, direct the bird into a corner and then place a towel over the head enabling you to reach in and grab it from behind.

You can then gently secure the head with one hand by loosely holding the neck from behind, just below the beak. Hold the body under the other arm close to the torso, carefully restraining the wings.

Some sea and water birds will require more head or bill restraint, gloves and protective eyewear, as the point and sides of the bill are razor sharp. Care should be taken when handling and proper protective measures taken. Closing the bill with one hand and holding the body with the other is the ideal method, except with the diving species like Boobies and Gannets who do not possess external nostrils and breathe through the side of their bill. To keep the bill slightly opened, place one finger through the mouth, and the thumb and index finger on top to secure. Always direct the birds head away from your body to protect your face. Specialised hands-on training is recommended for learning how to rescue and handle pelicans.

Wading birds have long fragile legs and particular care must be taken with them.

Extra care should also be taken with the seabirds that rely on their ability to remain waterproof to survive; handling can compromise this waterproofing.

Credit: CWS

Mammals

Restraint methods used for mammals are varied and will depend upon the species involved. Defence mechanisms of mammals include the mouth/teeth, claws, rump and tail.

When capturing small mammals be prepared with a small net and where possible, capture/restrain them in a closed room to prevent escape. Nets should be made of a thick breathable material (e.g. cotton that will also create a dark area for it to rest once captured).

Mammals should never be 'scruffed' around the neck. They do not have excess skin around the neck as some domestic pets do. Most of our small mammals are arboreal and designed to hang on for safety; having nothing to cling onto frightens them. Scruffing is a very stressful method of restraint and should be avoided.

When restraining marsupials, be aware they may have pouch young (or a back-rider young). If so, you may have to adapt your restraint method to prevent injury to the young.

Equipment commonly used when capturing/restraining mammals includes a net, leather gloves, welding gloves, towels and cotton bags. Be aware that gloves can impede your dexterity and are not suitable for some species.

Possums

Adult brushtail possums have large strong claws and can inflict deep scratches and they will also bite. They will also use your leg or upright body as an artificial tree trunk if it presents as an opportunity for their escape! Possums are not normally an aggressive animal unless very frightened. Their defence mechanism is to sit on their haunches with both forearms out to the side. They will bring their arms in quickly, in a pincer movement using their claws. From there they will attempt to bite.

They are best restrained by throwing a thick towel over the possum and simultaneously grasping the back of the neck with one hand and the tail with your other hand. When holding the back of the head you will find there is no scruff and you will need to use a grasping technique for an adequate grip. Do not be aggressive, always grasp gently but firmly.

Common Ringtail Possums are the smaller of these species (weighing less than 1kg). An alternative method to handling small possums (including juvenile brushtail possums) is to use a pair of gloves and place your hand inside a cotton pillowcase. Using the pillowcase, scoop the possum into the pillowcase and restrain through the fabric. This gives you the added advantage of being able to quickly place the possum back into the transport carrier if you feel you are losing your grip on the animal.

Once in a dark pillowcase and put into a supine U-shaped position, the possum may relax. However, be cautious of seemingly relaxed, sleeping or unconscious possums as they can suddenly come to life when picked up; hence the name "playing possum".

Credit: CWS

Gliders

Gliders are equipped with very sharp teeth and can inflict a painful bite. Even the tiny Feathertail Gliders can deliver a sharp nip.

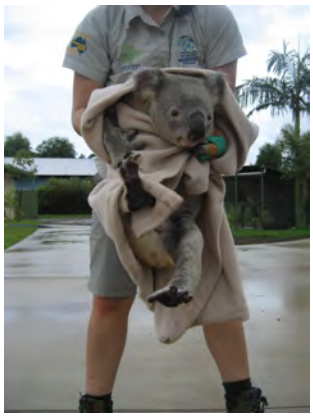
Gliders can rotate more than possums and require a small towel (cotton tea towel or a thin face washer is ideal). Grasp the back of the head with your thumb on one side and your forefinger on the other side to avoid being bitten. Hold gently around the body.

You can also restrain a glider by using a pillowcase or pouch as a glove.

Credit: CWS

Koalas

Koalas are highly prone to stress, which should be carefully considered in any capture situation. Koalas should be caught using a large blanket (not too thick that you cannot get adequate grip) or a thick folded towel.



Grip the koala's forearms (between the shoulder and elbow) with the blanket ensuring that the head is covered. Roll your hands in to create protection with the blanket so it bites that instead of you.

Never pick them up around the ribs or under the arms.

Juvenile koalas can be handled by supporting their weight under the rump and holding their forearms, but sometimes they can be aggressive and will require the adult towel technique.

Credit: AZWH

Bats

Australian bats are known to carry Australian Bat Lyssavirus so no one should attempt to handle them unless fully vaccinated. Appropriate PPE should still be used by vaccinated rescuers at all times.

The recommended handling technique for mega-bats is to use a thick towel to wrap around the bat so it is firmly secured and gently hold its head to prevent being bitten. There are of course rescue situations where gradual restraint is required i.e. where a bat is gradually freed from barbed wire. This more complex rescuing is covered in the Wildcare bat rescue workshop.

Microbats can be wrapped in a tea towel or small cloth and gently restrained in one hand allowing the head to protrude between the thumb and forefinger.

Infants can be placed on a rolled hand towel. Once holding on wrap in another towel for support.

Source: Caring for Australian Wildlife (S. White)

Echidna

To pick up an echidna, wear gloves or use a large towel (bare hands can be used once comfortable with the technique). Place hands on either side of its body between the forearms and hind legs. It will naturally curl into your grip, lift up and support against your body. You can also use a towel against your body (or wear a fleecy jumper) to reduce the chance of being spiked.

Echidnas are incredibly strong and stubborn animals.

Remember, echidnas do not tolerate high temperatures so they should not be handled for excessive periods, particularly if they are wrapped in a towel. Do not provide any artificial warmth to an echidna.

Credit: Karen Scott

Bandicoots and Rodents

Adult bandicoots have very strong hind legs and can deliver a fairly nasty kick and can also inflict a painful bite. They have a fragile tail and should never be restrained by the tail as it can be pulled off or degloved in extreme situations. They are also slippery and can be difficult to secure firmly. They have also been known to "stress moult" in some stressful situations.

Handle by either grasping the back of the neck or making a V; hold two fingers around the head and your thumb and ring finger behind the front legs. Hold the two hind legs in your opposite hand with its rump resting in your palm. A towel can assist until you are comfortable with this technique.

Juvenile bandicoots can be cupped in your hand if not biting.

Small mammals can also be restrained with the aid of a cotton pillowcase. Place your hand into the pillowcase and scoop the animal into the inverted pillowcase securing around the back of the head (as outlined above as a method for restraining possums). These small animals are difficult to keep a firm grip on and using the pillowcase method may help prevent accidental escape.

Bandicoots have very sensitive noses so be careful to avoid injury. Death can result if the damage is severe.

Credit: AZWH

Credit: Karen Scott

Macropods

Large macropods require several people and should only be handled if you are experienced in dealing with them. They have the ability to cause serious injury.

For small macropods such as wallabies, grab the base of the tail (right up towards the rump) and lift off the ground directing the legs away from your body. Support the chest with the other and face the legs away from your body and others. Place them head-first into a macropod bag (heavy duty cotton bag 1m x 1m) and position them into a U shape.

For larger macropods such as kangaroos, if they are unable to get up have several people approach from behind sharing the weight to hold down the tail and shoulder area stopping it from turning. Cover the head and body quickly with a blanket and stay clear of the legs.

Large macropods should not be examined under manual restraint, they must always be anaesthetised.

Be very respectful of their powerful kick. Small joeys can be held gently in your hands and placed quickly into a pouch to reduce stress.

Wildcare rescuers are instructed to always refer adult macropod calls to their closest Trauma Carer.

Credit: Roy Webster (below left) and Karen Scott (below right)

Carnivorous marsupials

Carnivorous marsupials range in size from small species such as antechinus and phascogales through to quolls (although quolls rarely come into care in South-east Queensland).

They need to be handled carefully as they have sharp teeth and powerful jaws.

Large dasyurids (such as quolls) should only be handled by experienced rescuers. They can be handled in a similar way to possums, keep them away from your body when being restrained and be aware they can climb back up their own body and bite.

Small dasyurids (such as phascogales and antechinus) can be handled with one hand restraining the back of the neck with the thumb and forefinger with the other fingers gently enclosing the body, taking care not to crush them. They are best restrained in a cotton pouch so that if you feel that you are losing your grip, you can easily contain them in the pouch.

Do not be fooled by their size or cuteness – they can bite – HARD!

Platypus

Platypus very rarely come into care and are considered to be a highly specialised species.

The bill of the platypus will not cause you any harm however the males do have spurs on the back of the hind legs and the spurs on adult males are known to be venomous (with a very painful toxin).

To restrain, place a towel over the animal and pick up by securing gently around the back of the head with one hand and base of the tail with the other.

Platypus' do not tolerate high temperatures and require air temperature of 25 degrees or less. Do not restrain them in a towel for too long in warm weather as they may easily overheat.

Source: Caring for Australian Wildlife (S. White)

Although containment is mentioned here as the last step, this is really a step that should be prepared before you attempt to capture and/or restrain any animal. It is poor practice (and embarrassing!) to capture an animal and then realise that the transport carrier is still in your car!

What you will need:

- Transport container suitable to the species – should be large enough to not damage feathers (for birds) but small enough to prevent excessive movement.
- Towels to line the bottom of the container
- Cage cover (could be another towel or small cotton sheet)

You should refer to the SPECIES INFORMATION SHEETS for each wildlife species which sets out in detail the preferred method of containment.

Get your transport container ready

Once you have selected a suitable sized transport carrier, you need to prepare it so that it is ready to house the animal once captured.

Line the bottom of the carrier with a folded towel. Make sure that the towel has no holes or frayed edges as animals can become entangled and sustain further injuries. It is preferable not to use newspaper in the bottom of the carrier as it doesn't provide any cushioning or support to the animal, which is especially required during vehicle transport as they can easily slip around the cage/box, which adds to their stress and can cause further injuries and pain.

If the animal is quite debilitated (e.g. it cannot stand up or move around freely), position other towels around the edge of the carrier. Fold a towel in half, roll it up and place it in a U shape in the carrier. This provides good support to animals that are weak or are in shock but still provides them enough room to move around if they need to.

Covering the rescue cage

As soon as the animal is contained, it is important to cover the carrier immediately. This reduces stress on the animal by allowing them to be less exposed to us humans (remember they will regard us as predators), and provides them with a dark environment (which aids in the treatment of shock).

Often bystanders will want to have a close look at the animal, but remember that the animal will be stressed from the trauma of the incident and from the capture. It is important to gently remind bystanders that the animal is injured and stressed and needs to be kept calm to reduce the risk of additional injury or stress-related conditions.

Once the animal is contained and covered, place the carrier in a quiet environment as quickly as possible. If you still need to speak with bystanders or pack up other equipment, place the animal into the car and close the doors (turn the air-conditioner on in warm weather), or else place in shade in a safe, quiet place until you are ready to leave. Although it is good practice and opportunity to promote wildlife needs by speaking with bystanders, most will understand you excusing yourself quickly in order to get the animal to immediate veterinary care where the animal is in a critical state. Be aware that the cool air from your car air-conditioning system may not penetrate the cage cover, so in hot weather or hot vehicles, lift a portion of the cage cover to ensure cool air can enter the transport container freely. Always ensure the

animal is in the air-conditioned space in your car. Animals that were active during captures can overheat quickly in confined spaces.

If the animal is already contained

If you go to collect an animal that is already contained, make sure that you check that the box or container is secure to prevent escape.

If the box/container is clearly not suitable or secure, ask the resident if you can transfer the animal into a more secure container in an enclosed space such as a laundry or bathroom etc.

Alternatively, place the box/container in a larger suitable transport carrier as it is. If the animal escapes, at least it will escape into a secure transport carrier.

Credit: AZWH

Step 5 – Transporting

Wildlife should be transported without delay to either a wildlife hospital, veterinary clinic or to your home for assessment/care (as appropriate). Transporting wildlife in a vehicle will be stressful for a wild animal, particularly adults.

Below are guidelines that should be adopted when transporting wildlife:

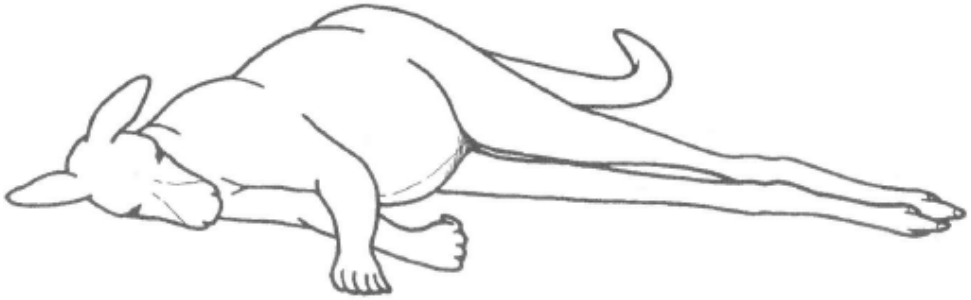
- Place the transport carrier on the floor of the car behind the passenger or driver's side. If this not possible, place it in the middle of the vehicle (not on the edge of a seat) to minimise the box from moving around corners.
- Ensure the transport carrier is well secured in the vehicle. Use either a seatbelt or carrier/cargo straps to secure the carrier.
- Reduce noise in the vehicle. Turn the radio off and keep voices low.
- Do not transport wildlife in the vehicle with pet dogs or cats.
- Do not keep disturbing the animal – now that it is contained, leave it to rest and recover from the capture.
- Do not transport in the trunk/boot of a car or in the open bed of a ute/pickup.
- Do not smoke in the vehicle – the smell can intensify the animal's sense of danger.
- Ensure that only one animal is contained in each transport carrier (with the exception of mother and young or nest of baby birds).
- Keep the vehicle's interior temperature constant. Maintain a temperature of approximately 23-25°C.
- Keep the windows of the vehicle up.
- Avoid transporting animals for prolonged time periods.
- Never leave an animal unattended in an enclosed vehicle.

Transporting Critically Injured Animals

When transporting critically injured wildlife, it is imperative you pay particular attention to the way that the animal is placed into the transport carrier.

Animals should be placed in a way that will not restrict their breathing. Unconscious animals should be placed in an adequately sized, well-padded transport carrier and positioned in such a way that their head is above the level of their stomach to prevent choking in case they regurgitate/vomit. The head and neck should be extended to allow them to breathe freely, and the mouth and nose should be pointed downwards to allow saliva and/or blood to drain from the mouth easily.

It is imperative that critically injured wildlife is kept as still and quiet as possible. Animals that have been subjected to trauma will often be suffering from internal bleeding. Unnecessary movement and stress can increase bleeding and thereby reduce the likelihood of their survival.



Unconscious animals or those with a compromised airway should be placed with their head slightly above the level of their stomach to prevent choking. The head and neck should be extended to ensure that the animal can breathe easily.

Source: Care of Australian Wildlife (Walraven)

Signs of Death

In some instances, wildlife may die just after their rescue. Being able to assess whether the animal has passed away is an important tool and one that inexperienced rescuers often question when they first start out.

Signs that the animal has died include:

- **Lack of heartbeat** (place your hand over the thoracic/chest area and feel closely for a heartbeat). This is difficult to do in reptiles.
- **No respiration** (check the thoracic/chest area carefully and monitor for the rise and fall of the lungs). Note that reptiles can hold their breath for a long time or breathe so shallowly you may not notice.
- The pupils will be **widely dilated**
- The animal may exhibit **agonal breathing** just before death (sudden gasping and difficulty breathing)
- The animal will have **no reflexes** – touch the eye and monitor for blinking or eye movement
- The corneal surface of the eyes become **glazed and wrinkled**
- **Rigor mortis** may have already begun to set in. The length of time that this takes will depend upon the ambient temperature and the size of the animal.

If in doubt, take the animal to your nearest vet for confirmation of death. Reptiles are best to be taken to a wildlife vet where they can check for a heartbeat using a Doppler. Always slowly warm reptiles. They can also be placed on a piece of paper where a body line can be drawn around the body. This will allow visualization of small movements that may indicate that the reptile is not deceased.

Common Rescue Scenarios

Credit: Karen Scott

Introduction

When you become involved with wildlife rescues, one thing that you quickly learn is that no two rescues are identical. One of the greatest lessons that a wildlife rescuer will learn is that they must be prepared for anything. It is very common to attend a rescue after being told what the species is and the predicament only to find that when they arrive on site, that the species is completely different, and the situation is not as described.

We have all headed out to rescue what we were told was a baby Wedgetail Eagle only to arrive and find a Crested Pigeon! Other examples include being called for a young kangaroo only to find that it is an 80kg male kangaroo or the snake that is 2m long only to find that it is only 12 inches long!

It is impossible to list every possible rescue scenario but listed below are examples of some of the more common types of rescue situations and a brief outline of the procedure to be adopted.

When called out to rescue a marsupial (e.g. macropod, possum, glider, bandicoot) always assume that a joey could be involved. A well-prepared wildlife rescuer will have a 'joey kit' as part of their rescue equipment.

The basic equipment you will need for orphaned joeys includes:

- Carry cage, basket or bag
- Warm outer pouch (e.g. feather pouch or thick cotton pouch)
- Cotton inner pouch liners (size will depend upon the species and age of orphan)
- Hot water bottle filled with warm-hot water (not boiling water) or Snugglesafe Heat Disk (pre-warmed before leaving)
- Protective gloves (for older orphans that may bite or scratch)
- Disposable gloves (for messy situations)
- Scissors (for cutting the mother's teat if joey is still attached)
- Safety pin (for pinning the teat to the inside of pouch liner)
- Waterless antibacterial hand wash (for sterilising hands afterwards)

Before you leave home

The Hotline operator will provide you with the contact details of the caller. It is recommended that you telephone the caller yourself and obtain more information such as:

Where is the joey?

If the joey is still in the mother's pouch, and if you are going to be more than ten minutes, ask the caller to wrap the mother's body in a blanket or large towel to try to maintain body temperature until you arrive, particularly if it is winter and the mother has only just recently been killed. If the joey is not in the mother's pouch, ensure the caller has the joey appropriately secured and is applying gentle and appropriate warmth. The joey should be wrapped in a pillowcase, towel or blanket with the head covered to minimize stress. Discourage the caller from removing the joey from the pouch, if they haven't already done so. If a dead mother with live joey is still on the road, instruct the caller to remove the mother from the road (provided it is safe for them to do so).

Does the joey have fur?

This will help establish what artificial warmth (if any) you will need to take for the joey. If the joey is unfurred, or has only a light covering of fur, then you will need to take a prewarmed Snugglesafe Heat disk or a hot water bottle.

Does the caller know when the mother was killed?

It is very important to establish a time frame. A joey whose mother was killed quite some time earlier will be dehydrated, in shock and could be suffering from hypoglycemia and/or hypothermia.

Place the prewarmed Snugglesafe disk or hot water bottle in the outer pouch so that the pouch liners are being warmed while you are traveling to collect the orphan.

When you get to the rescue

When you first arrive, take a moment to assess the situation. Make sure that the mother and/or joey is in a clear and safe position well off the road.

Check whether the mother is dead, if not, leave the joey in the pouch and make arrangements to get the mother to a vet immediately. For macropods, contact the nearest Trauma Carer without delay. In this instance, the first priority is dealing with the mother's injuries.

If the mother is dead, check her body temperature. If her body is cold, you will need to remove the orphan from the pouch promptly. If her body is warm, you may opt to leave the joey in the pouch and transport both mother and baby home before removing from the pouch. In this instance, place the Snugglesafe or hot water bottle under the mother's body (but not directly on the pouch area) to maintain the mother's body temperature. If you live more than 5-10 minutes from the rescue site, remove the joey at the scene. Leaving the joey in a dead mother's pouch for too long can expose the joey to bacteria that may impact on the joey's survival.

Before attempting to remove the joey from the pouch, check whether the teat is still in it's mouth. For joeys with a fine covering of fur, you can use your thumb and forefinger to gently apply pressure to the sides at the back of the mouth and the joey should release its grip on the teat. If this is unsuccessful, remove the joey by cutting the teat (see guidelines below). For finely furred or furred joeys, remove them from the mother's pouch by gently scooping them into your hands and removing from the pouch. Place them into a pre-prepared pouch. Never pick up a macropod joey by grasping around the ribs as you would a dog or cat as you can do enormous damage to their fragile ribs. Larger macropod joeys can be removed from the pouch by grasping the base of the tail as close to their body as possible with one hand. Cup your other hand between their arms and place them headfirst into your cotton pouch.

If the mother's pouch is very tight and you aren't able to get your hand inside, you may be able to gently maneuver the joey out of the pouch by manipulating the joey gently from the outside. If this is unsuccessful you will need to cut the mother's pouch taking care to keep your fingers between the scissors and the joey (and again only doing this after confirming the mother is deceased).

For small unfurred joeys that have the teat firmly in their mouth, leave the teat in the mouth. Get your scissors and safety pin from your rescue kit. Put the safety pin through the mother's teat towards the abdominal wall. Stretch the teat a little and cut it close to the mother's belly. Place the joey immediately into the warmed pouch liner and pin the teat to the liner. This will ensure that the joey does not swallow the teat. Never attempt to pull the teat out of the joey's mouth as you can cause irreparable damage to its mouth.

Put the joey into your outer pouch. For smaller mammals (possums, gliders, bandicoots, antechinus) secure the inner pouch liners with an elastic band to prevent the joey from climbing out and escaping and/or getting cold.

Common Brushtail Possum joey being removed from its mother teat.

Photo above – safety pin has been placed through the mother's teat and it is being cut between the mother's abdomen and the safety pin.

Photo below – joey snug in pouch with the teat pinned to the pouch.

Credit: Karen Scott

Before leaving the rescue site, take note of the following:

What species the mother is.

Identifying the mother is a lot easier for an inexperienced rehabilitator than trying to identify a small unfurred joey. If you are unable to take the mothers body and cannot identify the species take a photo with your mobile phone and send it to your Species Coordinator to be identified.

What injuries the mother sustained.

This information may be beneficial in pre-empting injuries that the joey may have also sustained. For example, if the mother received injuries to her abdomen or lower extremities, there is a stronger chance the joey could also be injured.

What condition the mother was in.

Had the mother only recently been killed or was her body condition indicative of having been killed one or two days earlier? This information will assist you in determining whether the joey requires immediate veterinary attention for dehydration and shock.

Check how many joeys there are.

It is important to understand how many young the various marsupial species have. The following is a guide to common species encountered.

Common Brushtail and Short-eared Brushtail Possum (Mountain Brushtail Possum)	Normally only have one joey but occasionally have twins.
Common Ringtail Possum	Can have up to 3 joeys. Make sure you scour the surrounding areas in case you miss one.
Squirrel and Sugar Gliders	Can have up to 3 joeys
Yellow-bellied Glider	1 joey
Greater Glider	1 joey
Feathertail Gliders	2 to 4 joeys
Wallabies, kangaroos and pademelons (macropods)	1 pouch young and often also an 'at foot' joey
Koalas	1 joey
Bandicoots	2 to 6 joeys

Note: Twins can occasionally occur in all species that predominantly only have one joey.

Photo left – Common Brushtail Possum with twins. This species usually only has one baby at a time, but twins are occasionally seen.

Credit: Lee Pirini

Contacting your Species Coordinator

It is important that joeys receive appropriate care as soon as possible if they are to have the best chance of survival. In some instances, this may mean transferring the animal to a more experienced rescuer or carer immediately. Because many of the orphans are in a critical state, they will often be stabilized by a more experienced wildlife carer and then be passed onto a less experienced rehabilitator who then cares for that animal.

The Species Coordinator will need the following information:

- The species
- Weight
- Development (for example unfurred, eyes open, eyes up)
- The circumstances under which the animal came into care (road trauma, dog attack)
- How long the joey has been without maternal nutrition (this may be unknown)
- Any visible injuries

Your Species Coordinator will then give you directions as to the appropriate course of action to take.

Swamp Wallaby hit and killed by a car.

Unfortunately most people that hit wildlife do not stop to check that the animal is dead or whether it has a joey in the pouch.

It is imperative that all wildlife are pulled off the road and that all marsupials and flying foxes are checked for young.

Credit: AZWH

Bird hanging from a tree or nest

Birds such as magpies and magpie larks often get tangled in unsuitable material collected for nesting (such as twine, string, fishing line). Rescuing is not an easy task as the bird is usually right at the end of a branch and often very high in a tree.

If entangled on a tree branch, use an extendable pole with a lopper head or tree saw attached. You may be able to saw off the branch (with the property owner's permission of course) and have at least two people underneath holding a large blanket to catch the branch and bird.

If the animal is out of reach, the Queensland Fire & Emergency Services may be able to assist.

Bird caught in guttering or television antenna

If caught in guttering or a TV antenna, you will need to gain access to the roof to remove. Do not attempt this if you are not confident or do not have the right safety equipment to do so. This should not be attempted on double-story homes as the risk of fall is great. Again, we must bear in mind possible legal consequences for volunteers that are injured during dangerous rescues. In these situations, it may be more appropriate to refer the rescue to the RSPCA or a commercial operator.

The bird can then be captured and restrained, and the entanglement removed with fine scissors. The bird should be assessed by a wildlife veterinarian to check for injuries.

Bird or Mammal on power lines

Never attempt a rescue on power lines. Always call the appropriately power supply provider (in Queensland this is Energex). Most power poles have a number on the pole. Advise Energex of this number and provide them with clear directions as to where the animal is.

In most situations, Energex will require a wildlife rescuer to be on site when they remove the animal so that they can arrange for appropriate care/treatment.

Animals caught in netting

A wide variety of species are prone to being caught in fruit netting including bats, gliders, birds and reptiles. Usually, the animal is entangled in the netting while it is over fruit trees however carelessly discarded fruit netting is also responsible for some entanglements.

Entanglements are best attempted with two rescuers. One person secures the animal with a towel and/or gloves and supports the animal's weight. The other rescuer carefully cuts the animal or bird free from the netting by cutting around the general area.

Often animals become entangled in netting at heights that make it difficult and sometimes unsafe for the rescuer to cut them free. In this case, it is best to cut the animal free quickly by cutting the netting around the animal at about 6 inches either side of the animal by using large sharp scissors such as kitchen shears. The animal can then be lifted down from the tree and continue to be restrained. This enables the rescuers to sit in a more comfortable and safe position to continue the disentanglement.

You can then get to work with cutting away the netting from around the body and legs etc. Make sure you get all the netting, and carefully apply gentle but firm restraint on the animal as some (e.g. gliders) will most likely try to escape. Animals should be assessed by a veterinarian to be monitored for damage due to restricted blood flow and damage to the mouth.

For complex cases where the animal is quite large or potentially dangerous, cut the netting away from the animal and transport it (with remaining netting entangled) straight to a vet. The animal can then be anaesthetised and the rest of the netting removed safely. This may be a less stressful option if a veterinary/wildlife facility is within a short distance of the rescue location. Again, blood vessel and nerve constriction are the greatest concern, and the animal will need to be attended to immediately. It is worthwhile phoning the wildlife hospital in advance so they can work in your arrival around their other triage cases.

Below: Grey-headed Flying Fox and Carpet Python caught in fruit netting
All species of wildlife are at risk of becoming entangled in fruit netting.
Credit: AZWH (flying fox) and Annette Bird (python)

Bird trapped in a building

This can be a frustrating and time-consuming rescue. First, the species must be identified as this may give the rescuer some clues as to how it might be lured down.

Open all doors and windows and turn off internal lighting. The bird will often fly out if it is brighter outside than in. If the ceiling is not too high, catch with net with telescopic handle. If you can get access to the building at night, it is sometimes easier to capture the bird when it is resting. A blue cover on the torch will be less disturbing for the animal but still enable you to see.

In smaller confined buildings, a sheet or tarpaulin can be draped in front of closed windows to keep the bird from striking them. If the roof is not very high, a hand-held net with a telescopic handle may be suitable to capture the bird.

For large buildings such as shopping malls, it is best to refer the business to a commercial wildlife management company. Often these cases are beyond the means of a volunteer rescue organisation.

Birds entangled in fishing tackle

Birds entangled in fishing line can be difficult to capture (refer to section on capturing birds with lures/snares etc). Birds in this situation should be referred to specialised wildlife rescuers that are experienced in this area.

Once captured, unless freshly hooked or snagged in fishing gear, it should receive a complete veterinary assessment. Often, they are underweight and suffering from infection.

Once disentangled, if a bird presents with no major injuries or signs of illness and is in excellent body condition, its immediate release can be considered. An experienced bird rehabilitator or wildlife veterinarian should make this decision.

For hooks/tackle that are deeply embedded, have been ingested or otherwise unable to be removed at the time, rescuers should transport to a wildlife hospital so that animal can have a general anaesthetic.

Credit: CWS

Orphaned baby bird or Baby fallen from nest or tree

Spring and summer are always busy months for wildlife rescuers, rehabilitators, veterinary clinics and wildlife hospitals. During these months, baby birds begin to fledge and leave the safety of their nest. While some individuals may become sick or injured and need our help, many do not but are rescued by well-meaning members of the public.

Healthy baby birds have a much better chance of survival when left in their natural environment with their parents.

All baby birds should be checked for injuries. If it is **injured,** it requires veterinary attention and should be taken to a wildlife hospital or local veterinary clinic.

If the baby bird is **uninjured**, try to establish where the nest is. The best option is to return the baby to the nest wherever possible. All rescuers should be familiar with the procedure to try to reunite baby birds with their parents. If this is not possible that young will need to be admitted into care.

It is extremely important to make every attempt possible to "re-nest" or reunite a healthy, uninjured baby bird with its parents. First you need to correctly identify the bird. In general, there are two types of birds – precocial and altricial.

Precocial birds are born covered in down with their eyes open and can feed themselves and walk soon after hatching**;** they include birds like ducklings, masked lapwings (plovers), brush turkeys, swamphens and moorhens. These birds usually nest on the ground. Some precocial chicks, such as the brush turkey are independent from the time of hatching and receive no parental guidance at all.

A precocial baby does not need to be placed in a nest. If it appears to be in danger and the parents are still around, place it under a dense bush or shrub in a nearby location and observe to ensure the parents re-join it. Parent birds have a strong parental bond with their babies and will return to protect the young as soon as they feel it is safe to do so. Do not offer the baby any food or water; it is best to leave feeding to the parents.

Precocial Chicks – Masked Lapwings
Credit – Sue Matthews

Altricial birds are completely dependent on their parents for warmth and food. They are born completely or nearly naked with their eyes closed and must be nursed until they are mature enough to leave the nest. These include the majority of birds such as honeyeaters, insectivores, parrots, pigeons, carnivores and most raptors. These birds usually nest in trees or off the ground.

There are two general stages of altricial baby birds; 'featherless' or 'fledgling'.

Featherless baby birds have no feathers to keep them warm. If the parents do not return soon, they will need to be taken into care. They need to be kept warm. Ensure that you provide gentle heat, such as placing them on a hot water bottle, which is well wrapped in a towel, while transporting them to a wildlife hospital or wildlife rehabilitator.

Fledgling baby birds have a significant number of adult-looking feathers. They have just left the nest and are learning to fly under the watchful eye of mum and dad who will teach them the survival skills that they will need to know as a bird; how to fly, what food to eat, how to find food and how to avoid predators. Please do not 'rescue' them unless they are in immediate danger. In this case, carefully place them on a branch in a nearby bush or shrub for safety. Mum and dad will stay close to keep a watchful eye on them.

Next, determine if the baby bird is suitable to be re-nested. Obviously, if the parents are known to be dead then the baby will need to be taken into care by a trained wildlife rehabilitator. Also, be aware that a sick or injured bird should not be re-nested; instead the baby should be placed in a box or basket, kept warm, in a dark and quiet environment and taken to a vet for examination.

Re-nesting altricial chicks with their parents

Most healthy, uninjured altricial baby nestlings with considerable down or feathers whose parents are nearby, are suitable to be re-nested and should be placed in a makeshift nest. The parents will continue to care for their baby in the new nest. Contrary to popular belief, they will not reject a baby because it has been handled by a human.

Birds that nest in tree hollows or closed nests
Native birds that raise their young in tree hollows or closed nests (such as termite mounds), are difficult to re-nest. Species such as parrots, lorikeets, kookaburras and kingfishers have more specialised nesting requirements and these should be referred to an experienced bird rehabilitator for advice, as they may need to come into care.

Birds that nest in open nests
Re-nesting is suitable for most species of common native birds that raise their young in an open nest including magpies, crows, noisy miners, magpie larks and butcherbirds.

What you will need:

- A plastic bucket (about 30-35cm deep) with wire or plastic handle or a plastic hanging plant pot
- A handful of leaves and small twigs
- A stick/branch (about 60cm long)

If you don't have a plastic bucket, you can use an ice-cream container (suitable for small birds), a hanging plant basket or sturdy cane basket.

4 easy steps to making a new home:

1. Drill or punch several holes in the bottom of the bucket or ice-cream container to provide drainage in case of rain.
2. Place a layer of soft leaves or grass in the bottom. Place the stick in the bucket at an angle by securing it into one of the drainage holes. This will allow the parents and baby bird to get in and out easily.
3. Place the baby in its new home. Hang the bucket at head height in a leafy tree, or tall bush, away from direct sunlight and predators and as close as possible to where you found the baby. The parents will not mind if it is in a different tree.
4. Watch from a distance to make sure the parents return to feed the baby. If the new home is disturbed, this may take several hours. If the parents do not return by dark, the baby will need to come into care.




There are some instances where we do need to intervene and bring the bird into care for assessment, treatment and possibly hand-rearing. Baby birds that show the following signs should come into care:

- Naked or near-naked altricial hatchlings that cannot be returned to the original nest (these are not suitable to be re-nested).
- If the bird has any injuries or has been in the mouth of a dog or cat.
- If the bird is cold and/or lethargic.
- If you notice the parent(s) dead nearby.
- When efforts to re-unite the baby with its parents have failed.

Do not kidnap healthy fledglings. The fledgling stage of development is an important time for baby birds as this is when they learn survival and feeding skills under the watchful eye of their nearby parents. Fledglings have a significant number of adult-looking feathers; they begin to hop and flutter around their surroundings and frequently fall to the ground. These babies do not need to be "rescued" unless they appear to be in danger or are injured, at which point they should simply be picked up and placed on a nearby branch.

After all, there is no substitution for the care of mum and dad!

Top left: This baby Tawny Frogmouth was found on the ground being protected by one of its parents.

Bottom left: The other baby was still in the nest high in a nearby eucalypt with the other parent. The nest was too high to enable the other baby to be returned.

A make-shift nest was made from an old cane basket (top right) and the baby placed into the basket. Immediately the protective parent flew to the nest and protected the baby.
One parent continued to care for the baby in the make-shift nest and the other cared for the baby in the nest.
Below shows one of the parents a few weeks later with both babies sleeping in a tree on the same property.
Credit: Karen Scott

Have you found a baby bird?

Healthy baby birds have a much better chance of survival when left in their natural environment with their parents.

STOP - PLEASE DON'T KIDNAP ME!

Do not take me from my parents, as they teach me all the lessons and survival skills that I need to know as a bird; how to fly, what food to eat, how to find food and how to avoid predators. **Please don't rescue me unless I am in immediate danger or I am sick or injured.**

Precocial chicks

Ducks, masked lapwings (plovers), swamphens, moorhens, brush-turkey.

I am born covered in down with my eyes open and can walk soon after hatching. I can feed myself but need the watchful protection of my parents until I am fully independent.

If I get separated from my parents, please help me by placing me safely under cover of a nearby dense bush or shrub and keep a watchful eye on me. My parents will return to protect me once they feel that it is safe to do so. Please don't give me any food or water – my parents will feed me when they return.

When should you intervene?

I may need your help if:

- I have no or little feathers and I can't be returned to my original nest;
- I am injured or have been in the mouth of a dog or cat;
- I am cold and/or lethargic;
- You noticed my parents dead nearby; or
- You haven't been able to re-unite me with my parents.

Please place me gently into a ventilated small box with a soft towel on the bottom and put me somewhere warm, dark and quiet. Please don't give me any food or water as I have a very specialised diet. Please contact your local wildlife care group for more information on how to help me.

Birds that raise their young in tree hollows or closed nests (such as termite mounds), such as parrots, lorikeets, kookaburras and kingfishers, are difficult to re-nest. They have much more specialised nesting requirements and these birds should be referred to an experienced wildlife carer for advice.

Legislation

Under the Queensland Nature Conservation Act 1992, it is illegal to keep protected wildlife without an appropriate permit. Wildlife carers have been trained to provide the best possible care for our native birds and have the equipment and specialised foods that they require.

Baby Bird Poster developed by Wildcare Australia Inc
www.wildcare.org.au

Altricial chicks

Honeyeaters, magpies, butcherbirds, magpie larks, kingfishers, parrots, pigeons, doves, raptors

I am born with my eyes closed and have no or little feathers to keep me warm. My parents look after me completely until I am old enough to leave the nest.

Featherless altricial chicks
If I have little or no feathers, I will become cold if my parents don't return quickly. Please keep me warm by providing some gentle heat (like a hot water bottle wrapped in a towel) and take me to a wildlife hospital or a wildlife carer as soon as possible. Please don't give me any food or water as I have specialised food requirements.

Fledgling altricial chicks
If I am starting to look like my parents and have most of my feathers, I have just left the nest and am learning to fly. Don't worry, my mum and dad are probably out looking for more food; they'll be back soon! If you are worried about me, place me on a branch in a nearby bush or shrub for safety until they return. Please don't feed me – I much prefer the food my parents will bring back for me!

How to make a new home for an altricial chick

I may need a helping hand if I have been adventurous and tried to fly a bit too early or bad weather has blown me to the ground. You can help me by building a makeshift nest. It's very easy and don't worry, my parents won't reject me because you have helped me!

A 'baby bucket' is a great nest alternative for birds that live in open nests such as magpies, crows, noisy miners, magpie larks, butcherbirds and tawny frogmouths.

4 easy steps to making a new home:-

1

Punch several holes in the bottom of a plastic bucket to provide drainage. If you don't have a bucket, use an ice-cream container, a hanging plant basket or cane basket.

2

Place a layer of leaves or grass in the bottom. Place a stick in the bucket at an angle by securing it into one of the holes. This will allow the parents and baby bird to get in and out easily.

3

Place the baby in its new home and hang the bucket at head height in a leafy tree or bush away from direct sunlight and predators and close to where you found the baby.

4

Watch from a distance to make sure the parents return to feed the baby. If the parents do not return by dark, the baby will need to come into care.

Ducks and Ducklings in the pool

The most appropriate option for this situation is to allow the ducks to vacate the pool of their own accord. If the ducklings are not able to get out of the pool, you can provide a ramp to enable the ducklings to exit the pool. Use a door mat or a piece of anti-fatigue matting and secure it at the end of the pool.

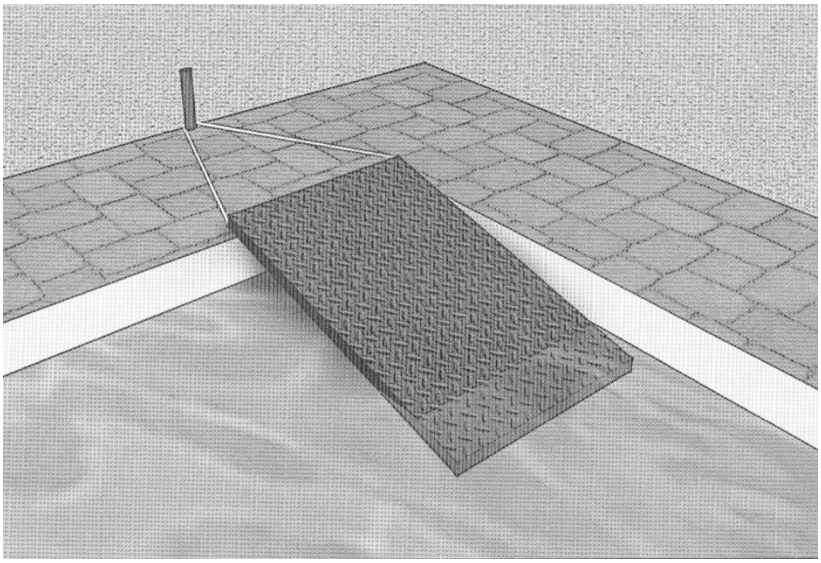
It is important to **turn off the filtration system** or the ducklings will be pulled in and killed.

It is essential not to separate the mother and father from their ducklings, therefore every effort must be made NOT to scare off the parents. Catching and relocating the ducks must be a method of last resort. If they must be caught, you MUST CATCH THE PARENTS FIRST or they may fly off leaving their ducklings behind. Sadly, it is usually only possible to catch one parent with the ducklings, leaving one behind. Ducks mate for life so try and choose a release site within walking proximity of the rescue site and walk the boxed ducklings to the area so that the uncaught parent can respond to their calling and follow.

Catch each parent duck with a long-handled net and then scoop the ducklings out of the pool with a net and secure in a box.

Never place the parent ducks in the same transportation box as the babies because the babies may get crushed.

When releasing, it is important to release the ducklings first. Then release the adults so that they are less likely to fly off and abandon their young. Move away promptly once opening the box containing the adult ducks to lessen the risk of them flying away from you on release.



A panel of anti-fatigue matting draped over the edge of a swimming pool and secured firmly is an effective method of allowing wildlife to get out of a swimming pool.

Source: Wildlife Search and Rescue: A Guide for First Responders (Dmytryk)

These rescue calls are often simply described as the possum being 'injured' or having 'burns'. The Wildcare Hotline operator will usually ask the caller a series of questions and may determine that the possum is suffering from dermatitis. These possums often present with missing fur and severely ulcerated wounds. Wounds are frequently found around the back/rump or face.

Capturing these possums can be difficult. It is much easier to capture these animals if they are frequently seen in the area and/or if the caller feeds them regularly.

If the possum is able to be located during the day when it is sleeping, they can often be captured by using a net or a thick towel and/or gloves. They can also be bagged (placing a large pouch or thick pillowcase over them), provided there is no opportunity for them to escape from the opening in the process.

Alternatively, the use of a humane possum/cat trap is commonly used.

To use a possum trap, the trap needs to be placed on a flat surface in an area where the possum visits regularly. The trap is set with food at one end which is generally secured in a hook. The trap door is spring loaded and once the possum walks into the trap and grasps the food, the door closes behind it.

When using a trap, you must be confident that the resident will follow instructions and closely monitor the trap. The risk of accidental trapping (i.e. trapping unintended targets) is high and the trap must be checked regularly throughout the night. It is not uncommon to also trap other species such as bandicoots and these should be released as soon as possible to prevent them from injuring themselves. The trap should be fully covered with a towel or light blanket upon capture to reduce stress.

Wildcare has produced an Easy Reference Sheet on using possum traps which is available to download from our website.

Humane trap suitable for trapping Brushtail Possums.

Possums or birds in Chimneys

Possums will often get caught in chimneys when they fall down the flue.

If the sides are smooth preventing the possum from climbing out and if the chimney is accessible from above, a rope or sheet secured from above and dangled down into the chimney may give the possum something to grip onto and climb up. The possum may also be able to be rescued from below using gloves and a towel – beware of claws and teeth.

In some situations, part of the chimney will need to be dismantled to remove the possum. As a volunteer wildlife rescuer, we should not undertake this. The caller should instead be referred to a commercial possum removal business that may be able to help and forewarned that a fee will be charged.

Once removed, the chimney opening should be wired or secured to prevent possums or birds getting in again.

Kangaroo or wallaby hit by car

These calls should be referred immediately to a Trauma Carer who has the experience and equipment to deal with these situations.

While you are waiting for a Trauma Carer to arrive, keep an eye on the animal from a distance. If the animal is quite mobile, stay well away from it so that it does not continue to try to move away.

Keep well-meaning bystanders away from the animal and inform them that you have called for help and that someone is on their way.

If the animal is in the middle of the road and the animal is quite immobile, you can drag the animal off the road by the base of the tail. Be careful when doing this. Do not attempt to pick up the animal – simply drag it off the road. Attempting to pick it up may result in you being kicked.

Animals Entangled in barb wire

A variety of wildlife species are commonly found entangled on barbed wire, including flying foxes, gliders and birds.

The process of removing an animal or bird from barbed wire is a similar process regardless of the species.

When planning the removal of the animal, it is important to follow all appropriate safety procedures for the species that you are dealing with. For example, when rescuing a bat, only vaccinated and experienced bat rescuers should attempt such a rescue.

These rescues should be carried out by two people. One rescuer should cover and restrain the animal securely. This enables the animal's body weight to be lifted off the body part that is entangled. The animal should be well restrained with the head firmly but gently held with one hand and the other hand supporting the body weight. This helps to reduce pain and stress on the animal and provides a safe working area for the other rescuer to work without fear of being bitten or scratched.

The other rescuer will need a variety of tools to remove the animal from the wire. Tools such as wire cutters (or small bolt cutters) and wide, flat pliers are required. The process of removing an animal from barb wire can be a time consuming one. The barbs can be individually cut off, being careful not to cut the animal's skin, membrane or feathers. The skin/membrane can then be slowly and carefully untangled. Ensure you are wearing safety glasses when cutting wire.

Bat rescuers recommend you do not cut the entire wire but just the barbs, due to the spring in the wire, followed by the need to then repair the section of fence that has been cut. However, if you have permission from the property owner to cut the barb wire, then you can cut the wire a few inches on either side of where the animal is entangled. This enables you to transport the animal immediately to a vet who can administer a general anaesthetic and remove the remaining wire and barbs without added stress and pain to the animal.

It is recommended that wildlife rescuer attend with a more experienced rescuer to gain experience in this specialised rescue technique before attempting on their own.

Little Red Flying Fox entangled on barb wire.

Credit: Mark Alexander

Reptile Eggs

The most appropriate outcome for discovered reptile eggs is to leave them undisturbed exactly as they are found.

If the eggs have been disturbed due to excavation, contact the Reptile Coordinator as they may be able to be incubated.

If the situation is such that the eggs MUST be moved, the eggs must be maintained in EXACTLY the same position as found. If they are rotated, they may die. You can use a marker pen to place a dot on the surface facing upward, to assist you to maintain their position during transit. Place eggs in a container with dry sand in the bottom to stabilise them, keep in same position as found, and keep warm (25-28°C) until you can transfer them to a reptile carer who has an incubator. Contact a Reptile Coordinator immediately - time is of the essence.

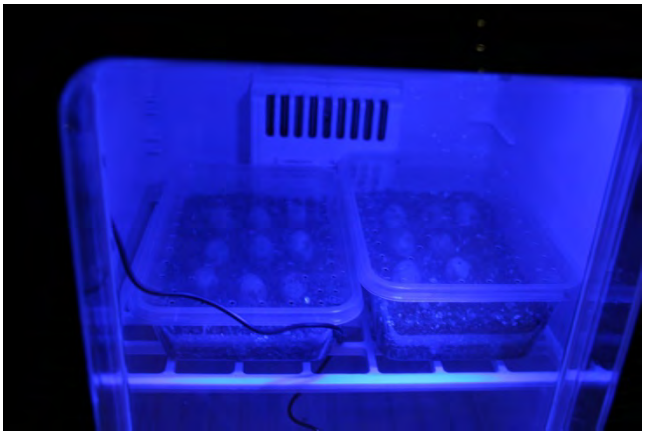


Photo Left: Incubator containing reptile eggs.

Credit: Annette Bird

Photo Bottom Left: Baby Bearded Dragons. These were hatched from a wild mother that unfortunately did not survive her injuries. A total of 16 babies were successfully hatched and released back to the wild.

Credit: Annette Bird

Orphaned reptiles

All healthy reptiles are independent after the first 24-48 hours after hatching from eggs. If hatchlings have not emerged from the nest and the nest looks disturbed or the hatchlings look "tired", they are probably simply recovering. Leave them alone and gently cover them back up.

If a baby is found and is moving/alert, leave it alone.

Frog found in fruit or vegetable box

Frogs that arrive in fruit and vegetable boxes CANNOT be released regardless if that species is found in the local area, as there is a high risk of spread of disease that affect our native frogs.

The frog should be taken to the Currumbin Wildlife Hospital, Australia Zoo Wildlife Hospital or RSPCA Queensland Wildlife Hospital.

Information on the disease risks associated with moving frogs can be found on the Australian Department of Agriculture, Water and the Environment website:

https://www.environment.gov.au/biodiversity/invasive-species/publications/factsheet-chytridiomycosis-amphibian-chytrid-fungus-disease

Water Dragon in Wire Fencing

Eastern Water Dragons commonly become trapped by their rear legs through wire fences. The easier retrieval method is to ideally have two people (one to restrain the animal and the other to remove from the fence). Wear gloves (if you are not confident). Place a towel over the head/body and gently restrain to prevent the lizard from biting and thrashing around and causes further injury. Try extending the rear legs towards the tail, gently turning the Dragon to extract it. You may need a lubricant such as canola oil to ease the extraction (making sure that you wash this off after extraction).

You may need to cut the wire if unable to free the lizard without causing further injury (remember to get permission from the homeowner first).

Check for injuries such as abrasions or lacerations and transport to a vet or wildlife hospital. Do not release any lizard with obvious injuries (even if it appears superficial) without talking to the Reptile Coordinator first.

Eastern Water Dragon entangled in a roll of discarded wire.

Credit: Karen Scott

Assessment Techniques

Burrow-young Echidna
Credit: Karen Scott

The Importance of Assessment

After rescuing any species of wildlife, you need to perform a thorough assessment of the animal if you are to provide the most appropriate care for the animals undergoing rehabilitation with you. Failure to perform an assessment, could result in the animal suffering, or even dying, from its injuries.

The assessment you perform should be based on the guidelines provided in this training manual and by using the Wildcare Rescue Examination Record and Progress Chart (refer to Appendix).

There are two aspects to conducting an assessment:

INITIAL ASSESSMENT; followed by a

THOROUGH PHYSICAL ASSESSMENT

The results of both your initial and thorough assessment should be sufficient to determine whether the animal:

- Requires immediate euthanasia; or
- Requires immediate veterinary attention; or
- Requires veterinary attention within 6-12 hours; or
- Requires no veterinary attention and simply needs ongoing care and monitoring.

All animals coming into care should have one of the above actions assigned following an assessment.

Obtaining an Accurate History

When receiving any animal into care it is essential to obtain an accurate history of what happened to the animal. This often means having to ask a series of questions of the person who found the animal. Obtaining a complete history on the animal will help determine their potential injuries and conditions (particularly those that are less obvious) and may indicate the severity of shock and dehydration they could be suffering from.

It is beneficial to re-confirm the history of the animal with the caller if the details are still unclear, as important details are often missed the first time you speak with them.

Examples of the types of questions that you should ask when trying to ascertain an accurate history include:

1. **When** did they first find the animal? Do not assume the animal was found immediately prior to the caller reporting the animal; often they were first noticed hours and sometimes days earlier. Establish the day and time the animal was first observed.

2. **Where** did they find the animal? Do not assume the animal was found at the location where you are collecting the animal. Rescued animals are often taken back to their residence by well-meaning community members.

3. Where **exactly** did they find the animal? For example, on the road, on the side of the road, under a powerline, near a pool/dam, in the back yard. This may give you an indication of what happened to it.

4. How was the animal **moving**? This may help to establish the animal's mobility and possible injuries. For example, an animal unable to use its back legs may have spinal trauma.

5. Has the animal been given anything to **eat or drink**? Remember, do not provide food or water to an animal in shock. If the animal has been given fluids or food, it is important to pass this information on to the vet.

6. Were there any **domestic animals** in the vicinity of the animal? If there is no obvious cause for the animal's condition, subtly establish whether the animal came into contact with the caller's pet dog or cat. Callers are often reluctant to disclose this information for fear that they may get into trouble.

7. Has the animal been given any **medication**, and, if so, what type, what time was it administered and how much did it receive? This is particularly important when collecting an animal from a veterinary clinic.

Make sure to retain the name and contact number of the caller so they can be contacted if further information is required. This is very important in situations where the rescue location is vague, as wildlife must be returned as close to their original rescue location as possible (where safe to do so).

Many animals have a "preservation reflex", which means they will pretend to be healthy even when they are sick or injured. This helps prevent them from being predated upon in the wild.

The initial assessment is therefore important, as it allows us to observe the animal either at the rescue scene or while it is in a cage or transport container, without the additional stress of being handled. At this stage, we are simply making visual observations which will guide us to possible injuries or conditions that may require immediate veterinary treatment or possibly euthanasia.

The things that you should look for include:

Demeanour

- Is the animal **bright** and **alert**?
- Is it **looking around**?
- Is it **depressed**, **quiet**, or **distressed**?
- What is the animal's level of **consciousness**?
- Is the animal **responding to stimuli**? Does it make eye contact, respond to noises in the environment and respond to movements nearby?
- Is the animal making any **noises** – hissing, grunting, teeth grinding?

General Body & Fur, Feather or Skin Condition

- Is the animal in **good overall condition**? (Refer to Species Information Sheets for information on assessing body condition for various species).
- Is the fur, feathers, scales and/or skin in good condition?
- Are there any **patches of fur, feathers or scales missing**?
- Are there any **open wounds**?
- Are there any **grazes**?
- Are there any signs of **bruising**?
- Are there any "**wet patches**" on the fur which may indicate saliva from a dog or cat?
- For mammals - take note of the **fur condition** - are there sparse areas, lack of sheen, does it have a nice thick coat, is the fur clean?
- For birds - take note of the **feather condition** – are the feathers in good condition or are they damaged or soiled, are the tail feathers clean, are there faeces around the vent?

Breathing

- How is the animal **breathing** - normal, slow and deep, laboured, open-mouthed, noisy, shallow or rapid?
- Is the animal **sneezing** or **coughing**?
- Is there a **noticeable effort** in breathing (rise and fall of the chest appears laboured)?
- Is there **audible breathing**, clicking, ticking or gurgling sounds
- Is the **animal shaking its head** (this can indicate an obstruction or head trauma)?

Mobility

- Is the animal **moving around**?
- Is the animal **sitting up** or **lying down**? Is this normal for that species? For example, uninjured possums will be sitting upright curled into a ball. Some mammals that are lying stretched out may be suffering from spinal or neurological damage. Birds often sit with their feathers fluffed up when sick or injured.
- Is the animal able to **move all of its limbs**?
- Is it **standing evenly** on all feet or is one limb raised off the ground?
- Are there any **abnormalities** in the animal's movements – such as only using front legs, one back leg dragging, swaying, falling over?
- In birds and bats, are both wings held in their **normal position** or is one drooping or falling away from the body?
- Is part of the body or the **head tilted to one side**?

Obvious Injuries, Discharges or Abnormalities

- Are there any **noticeable injuries** - such as fractured limbs, head injuries, open wounds?
- Are there any **discharges** such as blood or clear fluid - these can be signs of severe head trauma?
- Are there any **obvious abnormalities** – including lack of symmetry of the head and body?
- Does the animal have any **offensive smell?** This may indicate necrotic/old wounds.

Determining the Urgency of the Situation

After performing an initial assessment, you should be able to establish if the animal requires immediate veterinary attention.

Urgent veterinary attention is required if you observe any of the following during an initial assessment, as the animal could be critically injured and in severe pain and may require euthanasia:

- Blood or clear fluid from the ears, nose, mouth, cloaca
- Eye trauma including bleeding, asymmetry, protrusion, injury, swelling
- Unconsciousness
- Reduced mental ability
- Evisceration
- Moribund
- Obvious fractures
- Breathing difficulties
- Open wounds/blood flow
- Domestic animal attacks
- Showing any signs of severe pain or discomfort.

INITIAL ASSESSMENT - EXAMPLE 1

Scenario:

You attend a rescue for an injured possum. When you arrive at the property you see a Brushtail Possum lying in a garden. You don't immediately run up to it and scoop it up but you stop and observe it for a few moments.

During this time you:

- **Quickly scan the area for any immediate potential dangers** – you notice that the caller's dog is still in the yard unrestrained – ask the caller to restrain the dog while you attend to the possum.
- **Briefly look around for possible escape routes** that the possum may take when you approach it. In one direction is an open pathway which leads to a road so you would approach the possum in a direction that means it should head back away from the open pathway towards an enclosed section of the yard if it attempts to flee in the rescue process
- **Look at how the possum is sitting or lying** – you notice that the possum's hind legs are splayed out behind it.
- **Observe if the possum is moving** – you notice that the possum is trying to move but can only drag itself along the ground with its forearms.
- **Look at the general condition of the possum** – you notice that its fur looks dishevelled, appears wet in parts and there are some tufts of fur on the ground nearby.
- **Look at the possum's respiration** – you notice that the possum is breathing heavily, you can clearly see the rise and fall of its chest and it is breathing with an open mouth.
- **Look for any obvious injuries or discharge** – you notice signs of blood near the possum's rump.

By taking 5-10 seconds to complete this quick assessment you can determine:

- The possum has most likely come into contact with the resident dog.
- The possum has most likely suffered spinal or nerve damage which is why it cannot move its hind legs.
- There is little chance that the possum will escape as it will not be able to move quickly enough from you and will be unable to climb a tree.
- That the animal will require immediate veterinary attention.

You can then quietly and slowly approach the possum with a towel, cover the possum's entire body with the towel (including the head) and gently pick the possum up, ensuring that you support the spine well and place into a rescue cage.

INITIAL ASSESSMENT - EXAMPLE 2

Scenario:

You attend a rescue for a native duck that has a badly broken leg. When you arrive at the scene the duck is lying near a small lake in open parkland.

You would not have much success if you attempted to approach the duck and tried to pick it up. But if you stopped and did a quick assessment of the situation you would:

- **Have a quick look to see if there are any other obvious injuries** such as a broken wing – you notice that the wings appear to be okay, and the caller has commented that he has seen the duck flying.
- **Quickly scan the area and look around for possible escape routes** – you realise that the duck can still fly, so your plan to capture the duck will change significantly as it is likely to fly off or hobble to the canal and swim off.

By taking 5-10 seconds to complete this quick assessment you can determine that:

- You will need additional help and equipment from an experienced rescuer who is confident in catching flighted birds.
- It may not be possible to capture the duck at this point.
- If captured, the animal will require veterinary attention.

Once you have organised the additional help and equipment, you can then proceed to attempt to rescue the duck.

Thorough Physical Assessment

If, after performing the initial assessment, you determine that the animal does not appear to require immediate veterinary attention you can then use the information you observed to help you perform the **THOROUGH PHYSICAL ASSESSMENT**. During this assessment it will be necessary to actually handle the animal.

Refer to Section 1 - Wildlife Rescue (Restraint) for detailed information on correct methods of restraining wildlife.

Using an appropriate method of restraint for the particular species which you are assessing will help minimise stress and pain for the animal and reduce the likelihood of you being bitten.

Before you start, remember:

- Perform the assessment in a **quiet area** (away from other people and household noises) to minimise stress.
- It is best to perform the assessment in an **enclosed area** in case of escape.
- Try to **be quick but thorough**. It is best to do a proper examination and take a little longer, than be quick and miss something serious. With practise, the physical assessment should be able to be completed in less than five minutes.
- Ensure you **have everything ready** that you might need during the assessment including those items listed in your first aid kit.
- Take note of any **obvious injuries** observed during your initial assessment so as not to cause further pain.
- Complete the assessment as **quietly as possible.** Use slow movements throughout the entire assessment and keep noise to an absolute minimum.

Restraining the Animal

- Remember, if you are unfamiliar with the species you are handling, or the animal is particularly aggressive, you may need to **seek assistance from a veterinarian** to perform a thorough assessment under an anaesthetic. Do not attempt to do the physical assessment if you are not confident to restrain the animal.
- If you are not confident in dealing with **dangerous species** such as adult koalas, venomous snakes and bats, you should not attempt to handle the animal and should seek assistance from a veterinarian or a more experienced wildlife rehabilitator.
- Always handle the animal **gently but firmly** to avoid further injury and to prevent being bitten.
- **If handled roughly**, most wild animals will respond aggressively and are more likely to attempt to bite, kick or scratch you. This also makes their ongoing rehabilitation difficult as they are unlikely to settle into care.
- When picking the animal up, firstly **wrap it in a towel or place into a pillowcase**. When picking the animal up off the ground, ensure that you support the animal's full body weight. For example, do not pick up an animal just by the forearms or wings. For further information refer to the Species Information Sheets on handling individual species.
- Be **systematic** in your approach. Start at the head and slowly work your way down the extremities. Don't forget to assess the underside or back of the animal as well.

Recording your findings

You should follow your **Rescue and Examination Record Form** whilst performing the assessment. This helps to ensure you do not forget to assess any part of the animal. It is usually not possible to complete the form while you are restraining the animal, but you should read through it carefully beforehand to familiarise yourself with the areas you need to assess. Make a mental note as you continue with the assessment and then complete the form as soon as you have finished the assessment.

Using the Rescue and Examination Record Form, assess the following:

Demeanour

How does the animal react when you attempt to remove it from the rescue cage?

- An **animal that does not struggle** whilst being handled is likely to be very sick (although young animals will often not struggle excessively).
- If the animal is **trying to bite or scratch** or is vocalising in an aggressive manner (such as hissing) – this is usually a good sign!

Does the animal show any obvious signs of pain when you first attempt to handle it?

- An animal that **cries when picked up** is usually in a lot of pain. Most native animals do not vocalise except when they are in excruciating agony (although some may vocalise as a defensive tactic) – some species do not have the ability to vocalise. You need to be able to recognise the difference between vocalising in pain and aggressive vocalisation.
- Watch for **reaction when handling** – an animal that aggressively tries to bite you when you lift it out of a rescue cage may be in pain.
- Look for **subtle signs of pain** – such as ear flicking, tooth grinding or constantly changing position.

Adult Common Ringtail Possum

Note the way that it is sitting – leaning against its back with its head down and is clearly unresponsive.

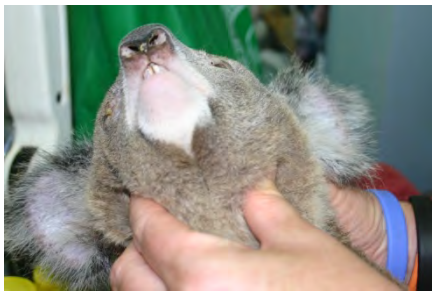
This is a clear indication that the possum is not well.

Credit: AZWH

Check for symmetry of the head by comparing both sides

- Look for any obvious **indentations, swellings and protrusions** that will indicate severe head trauma.
- Gently palpate both sides of the head and feel for any **crepitation** (movement or grinding of bone). Be very careful when checking for suspected skull fractures as heavy handling can cause further damage.


Above – Examination of the Skull
Gently feel the skull for evidence of crepitation or lack of symmetry

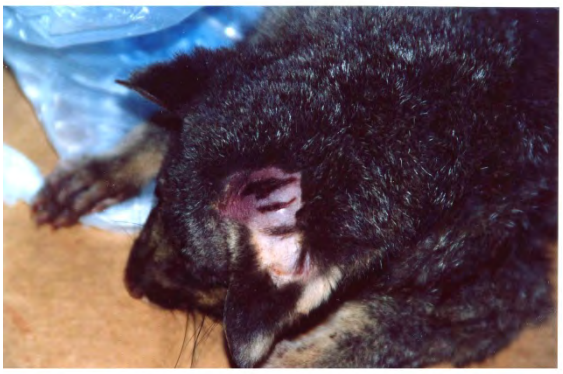
Above – Examination of the Jaw
Gently feel both the upper jaw or beak and lower jaw or beak for signs of swelling, crepitation or movement.


Above – Examination of the Ears
Ensure that both ears are checked thoroughly. If there is any evidence of blood try to establish whether the blood is coming from superficial injuries or from deep within the ear canal which might indicate brain haemmorage.

Credit: Karen Scott

Above – Sugar Glider
An obvious lack of symmetry – note the huge lump on the left-hand side of the glider's head.
Credit: AZWH

Above – Koala
Right hand side of face is obviously not symmetrical. In this case it is caused by a tumour.
Credit: AZWH



Above – Common Brushtail Possum
Animal has a fractured skull which is clearly visible.
Credit: AZWH

Above – Koala
Obvious lack of symmetry in the jaw area indicating a fractured jaw.
Credit: AZWH

Above – Koala
Obvious condition such as this tumour should be observed on an initial assessment
Credit: AZWH

Above – Common Ringtail Possum
Obvious head trauma evidenced by the presence of a large amount of blood.
Credit: Karen Scott

Examine the inside of both ears

- Look for any **sign of blood**. If traces of blood are found, try to establish whether the blood is from superficial wounds to the inside of the ear (such as small lacerations or ruptured ticks), or is coming from deep within the ear canal which would indicate serious head trauma.
- Look for any **sign of clear fluid**. Evidence of clear fluid flowing from the ear may indicate brain trauma which will require immediate veterinary attention.

Injury to left ear of a koala sustained as a result of a car trauma.

Credit: AZWH

Common Ringtail Possum
Note the blood coming from the ear canal. The possum sustained a head trauma as a result of a car hit.

Credit: Karen Scott

Common Brushtail Possum
Growths present on both ears which were cancerous tumours. This is a chronic condition.

Credit: AZWH

Examine the nose for signs of any discharge or bleeding

- If there are **signs of blood,** check whether it is coming from one or both nostrils.

Check for signs of swelling

- **Signs of swelling** can indicate fractures of the nasal bones.

Check the general condition of the nose/nostrils

- **Matted fur or feathers** around the nose may indicate a nasal discharge resulting from infection or could indicate trauma.

Australian Brush-Turkey

Note the blood coming from the bird's nares which indicates a head trauma.

Credit: AZWH

Koala

Abrasions to the nose caused by road trauma.

Credit: AZWH

Short Beaked Echidna

Note the lack of pigmentation on the beak (beak should be black) which indicates that the beak has been burned.

Credit: AZWH

Examine the exterior of the mouth and jaw

- Gently palpate both sides of the jawbone and feel for any **crepitation**.
- The **jaw alignment** should be even – if it is not, suspect a fracture.
- **Blood or swellings** over the top beak may indicate head trauma in birds.
- Check for external signs of **blood or discharge.**

Examine the inside of the mouth

- Carefully open the animal's mouth (if possible). In some cases, animals need to be anaesthetised or sedated by a vet to thoroughly check the inside of the mouth.
- Carefully check the **internal alignment** of the jaw. Road trauma victims often suffer fractures along the centre of the hard palate.
- Check for bleeding. This can indicate a fractured jaw, lacerated tongue or damage to teeth.
- Check the **animal's airway**. If blood is present, ensure there are no large blood clots that could restrict the animal's breathing – if so; remove with a long-handled cotton bud. If the mouth/jaw is still bleeding, ensure that the animal's head is facing down so that blood can drain from the mouth and prevent inhalation of blood into the animal's lungs.
- Note the colour of the animal's **mucous membranes** - they should have a nice pink colour to them. Pale membranes may indicate shock, trauma or severe blood loss. (Refer to notes on Mucous Membrane in this section).
- Check the animal's **capillary refill time** (Refer to notes on Capillary Refill Time in this section).
- Check the tongue carefully, particularly at the back of the mouth. If possible, gently pull the tongue forward to check for lacerations on either side and at the base.

Above –Koala
The evidence of blood and lack of symmetry are clear indications of a severe mouth injury. This is a veterinary emergency.
Credit: AZWH

Above – Common Brushtail Possum
Animal has obvious indications of a severe head trauma including a badly fractured jaw and eye injury.
Credit: AZWH

Above – Koala
Note the damage to the upper jaw by the evidence of the lack of teeth and haemorrhage. Also note the gap between the bottom incisors indicating a midline fracture of the mandible.

Above – Koala
Note the evidence of blood, the blood clots inside the upper lip and the swelling around the mouth and between the eyes which is indicative of a fractured jaw.

Above – Common Brushtail Possum
This possum sustained serious injuries to its jaw as a result of road trauma. The evidence of blood and the lack of symmetry is obvious.

Above – Grey Headed Flying Fox
Extensive mouth injuries caused when the animal tried to free itself from a barbed wire fence.

Above – Eastern Grey Kangaroo
Note the misalignment of the bottom incisors. The joey has an obvious undercut jaw. This could be a congenital problem but could have been caused by the use of incorrect teats for feeding.

All photos credit: AZWH

Examine the eyes for obvious signs of trauma or disease

- Check that **both eyes are present.**
- Examine the eyes by gently opening the eyelids.
- Look for signs of **blood or discharge** in or around the eye which might indicate trauma.
- Presence of **clear fluid** may indicate the eyeball has ruptured.
- Look for signs of **inflammation** which might indicate disease or trauma.
- Look for signs of **nystagmus** (involuntary flicking movement of the eyeball from side to side). This indicates head trauma.
- Check to see if the **pupils are clear** (for healthy animals) or cloudy/white in appearance (which might indicate evidence of cataracts or corneal ulcers).

Can the animal see?

- Does it follow your hand with its eyes and head?
- Check for a **palpebral reflex** by quickly moving your finger towards the animal's eye (as though you were going to poke it in the eye). A usual reaction should be for the animal to blink (note though that not all animals have a menace response).

Check the pupils

- Preferably examine the animal in a dimly lit or darkened room where the animal is more likely to open its eyes.
- Note the **size of the pupil** in each eye and check for response to light. Unresponsive pupils or pupils that react differently to each other can indicate head trauma. (Refer to notes on using Diagnostic Torch in this section).

Trauma Related Injuries

Above – Red Goshawk
Severe eye injury caused by trauma.
Credit: AZWH

Above– Mountain Brushtail Possum
Eye injury caused by road hit.
Credit: AZWH

Eye Problems Associated with Neurological Conditions

Above – Tawny Frogmouth
The clear lack of symmetry between the pupils is an indication that the bird has sustained a head trauma.
Credit: AZWH

Above – Infant Koala
This koala suffered a head injury and had obvious signs of neurological damage including the inability to fully open her left eye and a consistent tilt to her head. She did make a full recovery.
Credit: AZWH

Above – Common Ringtail Possum
Note that the left eye is not as open as the right eye. This possum sustained a head trauma and suffered from neurological damage.
Credit: Kathryn Kielly

Chronic Conditions Affecting the Eyes

Above – Common Brushtail Possum
This possum is suffering from dermatitis. This is a chronic problem and is not related to trauma.
Credit: AZWH

Above – Koala
This koala is suffering from the conjunctivitis, caused by Chlamydia.
This is a chronic condition and is commonly found in koalas in South East Queensland.
These animals are often reported as "blind" or have "lost an eye".
The eyes are still in place but the tissue surrounding the eye becomes inflamed and can become crusty from constant discharge.
Credit: AZWH

Congenital Conditions

Above – Koala
Note the difference in colour between the eyes. This is a congenital defect which would not affect the koala's ability to survive in the wild.
Credit: AZWH

Above – Red Necked Wallaby
The animal is suffering from micro-ophthalmia – the eyes are very small in size and the animal has very minimal vision. There is no treatment for this condition and animals born with this defect that come into care should be euthanased.
Credit: Karen Scott

Above – Swamp Wallaby
This wallaby is suffering from cataracts evidenced by the cloudy circle in the eye. In this case the cataracts were as a result of a birth defect. Cataracts can be caused by other conditions such as dehydration.
Credit: AZWH

Above – Koala
Infant koala suffering from congenital eye defect. She had very limited vision and was euthanased as she was unreleaseable.
Credit: Karen Scott

Corneal Ulcers

Above – Red Necked Wallaby and Common Brushtail Possum
Note the cloudy tinge to the eyes. This is indicative of corneal ulcers.
Corneal ulcers can be easily caused by dirt and other foreign particles becoming trapped in the eye and scratching the surface of the cornea.
Any change in the colour of the eye must be treated seriously and urgent veterinary treatment obtained if you are to save the animal's sight.
Corneal ulcers can be very painful.

Credit: Karen Scott (wallaby) and AZWH (possum)

Above – Red Necked Wallaby
This wallaby suffered a severe corneal ulcer as a result of a bacterial infection that penetrated the cornea. The wallaby required ongoing veterinary treatment for several months to repair the eye.

Credit: AZWH

Above – Australian Magpie
This magpie presented with cloudy eyes. The cause was unknown.

Credit: AZWH

Check all limbs and wings are present

- Sometimes the most obvious things can be overlooked.

Examine each limb or wing

- Palpate all limbs, bones and joints and check for signs of **crepitation**, swelling or pain.
- For **suspected abnormalities**, compare the injured limb with its normal partner.
- Take note of any abnormalities such as **loss of fur, feathers or scales.**
- Check for abnormalities on the **pads of the feet and hands** and evidence of possible burns or electrocution.
- Gently extend each limb/wing within its range of motion. Are the limbs/wings **symmetrical**? Do they face the same direction? Check that wings are sitting symmetrically against the body.
- Look for any signs of **paralysis**. Check to see if the animal is able to retract the limb/wing on its own. For birds, are they able to grip your finger or a towel?
- Inability to **voluntarily move a limb** is usually a sign of a fracture or spinal/neurological damage. If there is no response in the limb, check for deep pain response. (Refer to Nerve Response vs Deep Pain Response in this section).

Examine the claws

- Check that all **claws are present** (including orphans). Claws can be ripped out during road trauma and domestic animal attacks.
- Check the **condition of the claws.** Claws that are split usually indicate road trauma.

Missing Limbs

Above – Laughing Kookaburra
The bird's wing has completely been torn from the body. This is a veterinary emergency as the bird requires immediate euthanasia.
Credit: AZWH

Above – Bearded Dragon
Note that the left forelimb is completely missing. This animal required immediate veterinary attention.
Credit: AZWH

Fractured Limbs

Above – Blue Winged Kookaburra
The photo on the left shows no obvious signs of injury. The photo on the right is taken of the underside of the birds wing which clearly shows an open fracture to the wing. This injury could easily be missed if you failed to perform a thorough physical assessment. This injury requires euthanasia.
Credit: AZWH

Above – Australian Magpie
Open fracture to the left wing is clearly evidenced by the presence of blood.
Credit: AZWH

Above – Koala
Forelimb with multiple fractures and extensive wounds. This is a veterinary emergency.
Credit: AZWH

Trauma-related Injuries

Above – Common Brushtail Possum
The right forearm has been injured and has become necrotic. This is a veterinary emergency.
Credit: AZWH

Above – Sugar Glider
The left forearm has been severely damaged. This is a veterinary emergency.
Credit: AZWH

Above – Black Flying Fox
Note the holes in the left wing membrane. This type of injury is generally associated with barbed wire entanglement.
Credit: AZWH

Above – Sugar Glider
Note the damage to the right gliding membrane. This was caused by barbed wire entanglement.
Credit: AZWH

Above – Common Brushtail Possum
This possum suffered extensive burns to its left forearm when it was electrocuted. This is a veterinary emergency.
Credit: AZWH

Fingers and Toes

Above – Koala Claws
Split nails are often a sign of trauma –usually as a result of road trauma or dog attack. The nails are split when the animal grips onto the road when hit by a car or when the animal is trying to escape from domestic animal attack (such as clinging to a fence while being mauled by a dog).
Credit: AZWH

Above – Eastern Grey Kangaroo
The nail of one of the joey's toes was ripped out when the joey was flung from the pouch. The joey suffered no other injury. The injury became infected and required veterinary treatment over a period of 5-6 weeks.
Credit: Karen Scott

Above – Eastern Grey Kangaroo
This joey presented as an orphan as a result of a road trauma.
The joey had two (2) missing fingers on his right hand which had healed.
Missing digits can be easily overlooked if there is no sign of blood. A thorough physical assessment should disclose this type of abnormality.
Credit: Karen Scott

Assess the general body condition of the animal

- Does it appear to be obviously **malnourished**? (Refer to the Species Information Sheets for assessment of body condition for individual species).
- If the animal is in **good body condition**, you can generally assume that the animal has suffered some form of acute trauma or condition (such as a road trauma or domestic animal attack or the acute onset of disease).
- If the animal is in **poor body condition**, this can be indicative of an underlying chronic injury or disease.

Check for obvious signs of trauma or disease

- Take note of any **discharge, abnormalities, swellings, wounds, fur loss, fractures.**
- Examine the chest area – feel for **fractures**, **swellings**, observe the animal's **breathing**. If you are familiar with the technique, you can auscultate the heart and lungs and take note of heart rate and respiration rate (refer to Species Information Sheets).
- **Fur loss** can be indicative of domestic animal attack, road trauma or disease.
- Check for **matted fur.** This can often indicate an underlying wound.
- Check for signs of **bruising**. You will need to separate the fur or feathers to check the skin for evidence of bruising. Bruising is very obvious in unfurred joeys.
- Check for obvious signs of **evisceration** (external body parts that protrude through an opening in the body cavity).
- Check for **puncture wounds**. Evidence of puncture wounds may be very subtle. Check the fur/feathers for any evidence of wet (or dry) **saliva** that might indicate a domestic animal attack.
- Check the gliding membrane of gliders for **wounds, tears or punctures.**

Check for parasites

- Take note of any overburden of **parasites** (such as ticks, lice or mites).
- Check for maggots or fly-eggs. These are often located in inconspicuous and hard to reach places. Make sure that you check carefully.

Body Condition

Above– Koala
This koala is obviously in very poor body condition – easily evidenced by the protrusion of the ribs and pelvis and the excess skin around the abdomen. This koala was suffering from a chronic disease.
Credit: AZWH

Left – Red Necked Wallaby
This wallaby joey was presented extremely dehydrated and slightly underweight. Note the obvious protrusion of the pelvic bones and the ribs which was primarily due to dehydration. Pouch-bound joeys would not be expected to have any substantial muscle mass as they have not yet become active.

Credit: Karen Scott

Left – This koala is in poor body condition evidenced by the obvious protrusion of the scapula (shoulder) and the hollowed appearance around the abdomen.

Credit: Karen Scott

Obvious Injuries

Above – Collared Sparrowhawk
Notice the obvious drop in the right wing indicating a serious wing injury.
Credit: AZWH

Above – Black Flying Fox
The swelling on the left shoulder is very obvious.
Credit: AZWH

Left– Carpet Python
This juvenile python sustained an obvious wound to its upper body as a result of a cat attack.
Credit: AZWH

Fur Condition

Above – Common Ringtail Possum
The marked fur loss is as a result of a dog attack. This is a veterinary emergency.
Credit: AZWH

Red-necked Pademelon in poor body condition. It is underweight and there are patches of fur missing over its abdomen and rump area.

Credit: Karen Scott

Check the condition of the skin/scales

- Take note of any **obvious abnormalities**.
- Look for **chronic conditions** such as dermatitis or other fungal or bacterial infections.
- Abnormal skin conditions will require veterinary attention as an accurate diagnosis of the cause is imperative for the condition to be treated correctly.
- It is important to be able to distinguish between **normal and abnormal skin/scales.**

Abnormal Skin Conditions

Above – Koala
This koala was suffering from an extensive dermatitis-like infection which is often an indication of koala Retrovirus.
Credit: AZWH

Above – Platypus
This infant platypus was found suffering from a form of dermatitis. A skin scrap performed by a vet was conducted to diagnose the condition so that the correct medication could be prescribed.
Credit: AZWH

Above – Common Brushtail Possum
This possum was suffering from severe dermatitis on the rump and tail. Notice also the open wound on the hind foot.
Credit: AZWH

Above – Australian King Parrot
Notice the feather loss around the right eye.
Credit: AZWH

Normal Skin Conditions

Above – Eastern Grey Kangaroo
The brown substance covering the joey is quite normal. Unfurred joeys often come into care with some degree of exudate on their skin from the mother's pouch. This poses no danger to the joey and can be cleaned off over the course of a few days.
Credit: AZWH

Above – Red Necked Wallaby
The joey had an obvious birth mark on its back. This is not commonly found and is not of concern. The joey's fur grew a normal colour.
Credit: AZWH

Abdomen

Note the abdomen

- Take note of whether the abdomen is distended
- Check for 'gut fill' – indicative of whether the animal has been without adequate food or is malnourished
- Do not palpate an animal's abdomen where it is suspected of having been subject to any form of trauma.
- A veterinarian will be required to carefully check the abdomen for signs of injury.

Pelvis

Observe the pelvis

- Take note of the animal's mobility which may indicate trauma to the lower body and pelvic area.
- A veterinarian will check for signs of **instability, pain, crepitus and deformity.**

Ribs

Observe the Ribs

- Be mindful that injured animals may sustain fractured ribs.
- Be careful when handling to minimise pain.
- A veterinarian will be required to check for fractured ribs.
- Whilst handling gently, take note of any sounds which may indicate a penetrating wound to the pleural cavity. The sound of a 'crinkling' noise (like scrunching up cellophane) indicates air trapped between the subcutaneous layer of skin and the pleural cavity (which often occurs in the case of domestic animal attacks).

Spine

Observe the Spine

- Check the spine for any obvious signs of **deformity.**
- A veterinarian will be required to check for spinal fractures and abnormalities.

Left– Eastern Bearded Dragon
Note the deviation in the spine which indicated spinal trauma. His tail was also very necrotic.
Credit: Annette Bird

Left– Common Ringtail Possum
This possum suffered spinal damage as a result of a road trauma. She was unable to curl up or move her hind limbs.
Credit: Karen Scott

Check the pouch (for female marsupials)

- Check to see if **any young are present**. Are they alive?
- If there is no evidence of young, check the teat to establish whether the mother is **lactating**. A lactating female may indicate that an older joey has been abandoned at the rescue scene.
- Check for possible **infections, discharges, maggots, decomposing joeys.**

Check the scrotum (for males)

- Check that the scrotum is intact. Injuries to the scrotum are common in road traumas.
- Check for **lacerations** under or around the scrotum as these can often be overlooked.
- Check for any **swelling or abrasions.**

Check the cloaca

- Check for signs of **discharge** (such as blood) which may indicate internal bleeding.
- For males, check that the **penis** is not protruding. A penis that will not retract often indicates pelvic injury due to road trauma or dog attack.
- For animals suffering from **paralysis**, check for the presence of anal ring reflex by watching whether the anal sphincter contracts when stimulated.

Above – Koala
Koala with advanced form of cystitis. The constant leaking of urine onto her fur has resulted in total fur loss and ulcerations on her rump.
Credit: Karen Scott

Above – Koala
Koala with cystitis. Note the protrusion of the penis. The inability to retract the penis in males is often a sign of pelvic injury caused by road trauma.
Credit: AZWH

Left – Common Ringtail Possums
Always check the pouch of female marsupials for young. If there are no young present, check whether the female is lactating as this may indicate that there are back-young or at-foot young remaining at the rescue scene.
Credit: Karen Scott

Examine the tail

- Check for obvious signs of **injury, swelling or abnormalities.**
- Check that the tail is **straight** – a "kink" in a tail will be indicative of a fracture.
- Check the base of the tail – **fractures** at the base of the tail (near the animal's rump) are often overlooked.

Check the function of the tail

- Check that the animal still has the **full use of its tail** for balance and grip.
- Animals that use their tail extensively (such as possums that have a prehensile tail) should be able to grip onto your hand, towel or the carry cage for support.

Above – Common Brushtail Possum
Note the extensive wounds to the tail which have become necrotic.
Also note the wound beneath the scrotum.
Credit: AZWH

Above – Eastern Grey Kangaroo
Fresh wound on the tail caused by road trauma.
Credit: AZWH

In Summary

On completion of a thorough physical assessment, you should be able to determine whether the animal requires:

- **Immediate euthanasia**
- **Immediate veterinary attention**
- **Veterinary attention within the next 12-24 hours or**
- **Further monitoring and care.**

If any of the following have been noted during the physical assessment, it is essential that you seek veterinary attention urgently as the animal will be in severe pain or may require euthanasia:

- Blood or clear fluid from the ears, nose, mouth
- Eye trauma including loss of an eye, bleeding, asymmetry, protrusion, injury, swelling
- Head trauma
- Evisceration
- Unconsciousness
- Reduced mental ability
- Spinal / Neurological damage
- Fractures
- Breathing difficulties
- Open wounds and significant blood flow/loss
- Burn injuries
- Dog or cat attack victims.

Animals which require euthanasia MUST be taken to a vet as soon as possible. If you are unable to access a vet promptly, contact your appropriate Species Coordinator or veterinarian immediately for advice. It is unacceptable and poor animal welfare to not seek immediate veterinary attention for animals that clearly need to be euthanised.

Animals which do not present with any abnormalities, injuries or symptoms may be monitored under your care and, if required, referred to a vet within 6-12 hours. Some injuries may take some time to become obvious (e.g. bruising may not show up until several hours after the initial injury). It is good practise to repeat your assessment of the animal a few hours after admission if you believe it may have been injured (especially important in road trauma victims that may deteriorate over time).

If you are in doubt as to the severity of an animal's injuries, or unsure whether the animal requires veterinary attention, contact your Species Coordinator or veterinarian for advice.

Distinguishing Chronic Conditions from Acute Conditions

Understanding the difference between CHRONIC and ACUTE conditions will help to determine the urgency of the situation.

A **CHRONIC** condition is one which has been ongoing, usually for weeks, months and in some cases, even years.

Examples of commonly seen chronic conditions include:

- Skin infections (such as dermatitis)
- Malnutrition
- Diseases (such as Psittacine Beak and Feather Disease, Chlamydia)
- Parasitic infections

An **ACUTE** condition is one where the onset is sudden.

Examples of commonly seen acute conditions include:

- Trauma related injuries (e.g. fractures after being hit by a vehicle, hitting a window)
- Freshly bleeding wounds
- Stress/capture myopathy (in birds and macropods)
- Shock

Animals suffering from chronic conditions should be seen by a veterinarian as soon as possible, as many of these conditions can be extremely painful. However, where the animal is rescued late in the afternoon or during the night, provided the animal does not appear to be in excessive pain and can be made comfortable for the night, then it is acceptable to seek veterinary help first thing the following morning.

Any animal suffering from an acute condition should be seen by a veterinarian as soon as possible as the animal will be in pain and will require prompt veterinary treatment. Prognosis is improved if treatment of acute conditions is initiated as soon as possible.

Wildlife may present suffering from both a chronic AND an acute condition. It is important that a thorough physical assessment is still performed on these animals as soon as possible.

Common examples of where wildlife may present with both a chronic and an acute condition include:

- **A parrot with Psittacine Beak and Feather Disease being attacked by a cat**. Birds with this condition lose their ability to fly and are therefore on the ground more, leaving them more susceptible to being attacked by a cat or dog.
- **A koala with conjunctivitis (Chlamydia) that is then hit by a car.** Koalas with poor or no vision caused by conjunctivitis are unable to see potential dangers such as domestic dogs or cars and may be more susceptible to being attacked by a dog or hit by a car.
- An animal suffering from a **disease or condition causing malnutrition and weakness** that has then become subject to predator attack.

Recognising Life Threatening Injuries

A significant percentage of the animals received for care will be suffering from life threatening injuries. These animals all require urgent veterinary attention as they will require prompt assessment and treatment (including pain management) and, in some cases, euthanasia.

Life threatening injuries include:

- **Open wounds** with blood flow that cannot be controlled by applying a pressure bandage;
- **Injuries associated with a dog attack** (most victims will have sustained severe internal injuries);
- **Injuries associated with a cat attack** (punctures can be very deep and crush internal organs and bones);
- **Injuries associated with a road trauma incident** (animals may have sustained internal injuries, severe head trauma and fractures);
- **Clear fluid** leaking from the ears;
- **Evisceration;**
- **Burns – particularly in animals** with >50% of their body burnt;
- **Breathing** difficulties.

Many of these injuries can be recognised during an accurate and thorough physical assessment. Along with obvious indications of injury, patients will often present with:

- Respiratory distress (breathing that is laboured, irregular, raspy);
- Signs of pain;
- Markedly decreased or increased heart rate;
- Lowered levels of consciousness (limited ability to “fight back”);
- Eyes that are glazed, sunken, fixed, or pupils that are slow to dilate or constrict;
- Pale mucous membranes;
- Limited ability to move their limbs and body;
- Cold to the touch;
- Trembling and vocalising.

These animals require IMMEDIATE euthanasia!

Above – Australian Magpie
This bird has suffered a badly broken beak.
Credit: AZWH

Above – Eastern Grey Kangaroo
This joey sustained severe bruising when his mother was hit by a car. The joey sustained internal bleeding and numerous fractures. The kindest option was to euthanase the joey.
Credit: Terri Eather

Above – Common Brushtail Possum
This possum sustained a horrendous injury to his mouth/jaw which appeared to be several days old. The possum required immediate euthanasia.
Credit: AZWH

Above – Common Ringtail Possum
This possum suffered extensive injuries to both forearms. The possum was presented with advanced necrosis and was euthanased immediately.
Credit: AZWH

Left – Common Brushtail Possum
Advanced exudative dermatitis. This possum required immediate euthanasia.

Credit: AZWH

Recognition of Pain in Wildlife

An important aspect of your thorough assessment is to determine whether the animal is in pain and, if so, to what extent. Native wildlife does not display signs of pain in the same manner as domestic animals. They generally do not whimper or cry and therefore it can be difficult for new wildlife rescuers to recognise pain in a wild animal.

It is now an accepted industry standard that pain relief should be provided to any wildlife suffering from traumatic injuries.

Most pain relief medications need to be prescribed by your vet.

Common signs of pain in native wildlife could include any of the following:

- Sitting hunched with its head down;
- Sitting with its feathers fluffed up;
- Teeth grinding;
- Decreased response to stimuli – slow to respond to sound, appears asleep, eyes glazed;
- Aggressive behaviour;
- Avoiding normal movement – lame, sitting quietly;
- Keeping its eyes closed;
- Insomnia;
- Panting;
- Not eating or drinking;
- Increase in respiration and heart rate;
- Licking or picking at the sore area;
- Vocalising – very rare and is an end stage point in pain.

For information on specific signs of pain in different species, refer to the Species Information Sheets.

When trying to establish whether an animal is in pain, consider whether the same injury or condition would be painful to you - if it is, then it will also be painful for the animal.

Consider these aspects of your assessment: pain, discomfort and distress.

Pain is a physical phenomenon which we must assume all animals experience. It results when a noxious (bad) stimulus is recognised by the cell and passed along the nerves to the spinal cord and brain. Pain can be of different durations and of varying degrees (whether it is acute or chronic).

Discomfort is also a physical phenomenon and is generally considered to be a milder form of pain and can refer to an aspect of irritation such as a bandage that is too tight.

Distress is a psychological phenomenon and can be associated with pain and discomfort, but it can also be entirely distinct. Native wildlife can suffer from distress in situations such as where a mother is separated from its young, a social animal is kept alone, or a solitary animal is housed with or near others.

(Source: Lane & Cooper - *Veterinary Nursing* Third Edition)

Koala sitting hunched with head down and reluctant to look up – a common indication of pain in koalas.

Credit: AZWH

Minimising Pain and Discomfort

In addition to providing appropriate pain relief, it is important that we attempt to reduce the pain and discomfort experienced by the animal through:

- Ensuring the animal is sitting **comfortably** – use appropriate soft bedding and place in an appropriately sized carrier.
- Keeping the animal **clean** – do not allow the animal to sit/lay in its own urine and faeces. Native animals are very clean and laying in excreta will cause enormous stress to a wild animal.
- Ensuring the **ambient temperature** is appropriate – you do not want the animal to unnecessarily use its energy to keep itself cool or warm.
- Keeping the animal in a **quiet and dark room** away from unfamiliar noises and smells.
- Not **disturbing** the animal more than necessary – sick and injured animals need their rest. Try to group tasks together so that you do not need to disturb the animal more than necessary – for example, medicate the patient at the same time that you clean the enclosure.
- Keeping **handling** to a minimum – when necessary, handle gently and provide support to any injured parts of the body.

If your vet does not prescribe pain relief for an animal that you feel may require it, ask the vet politely to give consideration as to whether it is warranted. It is commonly accepted that providing pain relief assists with the recovery of the animal in that:

- The animal is more likely to be encouraged to eat and drink – therefore maintaining its energy to heal.
- It will be less stressed and less likely to deplete its immune system.
- It assists with healing – burns patients will often pick at and pull off wound dressings if they are in pain.

Some pharmacy medications can be used (such as Infant Panadol® drops or Painstop Daytime®) for mammals. These should only be used on the direction of your vet or an experienced Species Coordinator.

NOTE: Animals that require critical care should be admitted to a wildlife hospital and should not be kept at home!

Vital Signs and Advanced Assessment Techniques and Tools

There are a number of very important assessment techniques which wildlife rescuers and carers should aim to become proficient in. These techniques will assist you in conducting a thorough physical assessment and in determining the animal's condition.

Nerve/reflex Response v Deep Pain Response

Being able to determine whether an animal has feeling in its limbs is an important tool for wildlife rehabilitators to learn and is one that is often misunderstood. This is a useful technique particularly where full or partial paralysis is suspected (for example in road trauma or dog attack victims).

A reflex response is a response to stimuli that only involves the spinal cord and nerves and does not engage the brain. A reflex response is usually very rapid as it doesn't have to wait for the brain to process the stimulus and then tell the body what to do. An example of a reflex response is the patella response (knee-jerk response) when a doctor hits your kneecap and your leg kicks. A reflex response is not associated with the conscious movement of a limb or extremity and often an animal does not show any sign that it is aware of a stimulus (i.e. doesn't look at where a pinch or poke is coming from, or doesn't attempt to move).

A deep pain response is when a pain stimulus is detected by pain receptors and a message is then sent through the spinal cord to the brain. The brain then assesses the threat of the pain and sends a message back through nerves to muscles that then cause with withdrawal of the limb/extremity from that pain stimulus. It is a slower process than a reflex response and is usually associated with obvious other movements by the animal e.g. turning head to look at where the pain stimulus is coming from, or moving their whole body away from the stimulus.

Take for example an uninjured animal (gently try this on your dog or cat…or husband). Gently pinch the extremities (hand or feet) and watch the animal's reaction. An uninjured animal will retract the limb and look around, give you a nasty look and possibly even cry or attempt to bite you. This is a normal pain reaction. In this situation the pinching of the extremity elicits pain which is detected by pain receptors. A message is then sent along nerves to the brain to tell the animal to voluntarily move its limb away from the pain stimulus.

If you repeated this on an injured animal, you may or may not get the response of the limb retracting. If the limb retracts slightly then there is still evidence of a message getting to at least the spinal cord but not necessarily to the brain. This sort of response can be seen in an animal with a fracture of the spine that is higher up than the limb that you are pinching. Here a message from the limb gets to the spinal cord but doesn't get to the brain so the animal does not know there is any pain associated with the stimulus. If there is no retraction of the limb whatsoever, then the prognosis is very poor and often indicates significant spinal or brain damage. If there is no nerve response, then there is unlikely to be any pain response.

In order to assess a pain response, pinch the extremities again but take notice of the animal's reaction (and not any involuntary reactions from the limb). Pain response can usually be measured by:

- The animal turning its head towards the source of the pain or trying to move away from it
- In severely injured animals or animal suffering from severe shock, watch for more subtle responses such as ear flicking, teeth grinding, flicking of the tail etc.

If the animal shows no sign of recognising pain, then the prognosis is likely to be poor.

Mucous Membrane colour

The mucous membrane colour refers to the colour of the animal's gums in its mouth or the soft lining of the eyelids. If relates to the quality of the blood circulation. For most species the mucous membrane of a healthy animal should be pink in colour. An animal which presents with pale mucous membranes should be suspected as suffering from shock or severe anaemia and will require veterinary treatment.

Pale mucous membranes are a common clinical sign for a variety of diseases and disorders in animals. Often the shade of pink of the membranes in native wildlife is slightly lighter than that of domestic animals. It is important that you can perform this basic assessment on the animal in your care. Although an animal may also have very pale skin (e.g. tips of the ears, inner thighs, nose etc) circulation is best evaluated by looking at the mucous membranes in the mouth.

Deviation from the normal mucous membrane colour can be caused by a variety of different medical problems including:

- Decreased red blood cells (anaemia or blood loss)
- Severe dehydration (poor circulation)
- Severe thermal burns
- Hypovolaemic shock
- Pain
- Cardiac shock or failure
- Septic shock
- Peritonitis or other severe infection

The following is a guide to expected colour variations of mucous membranes and what they may indicate:

Pink	Normal/healthy. Different species will show slightly different shades of pink. Adequate perfusion/oxygenation of peripheral tissues.
Pale Pink	May indicate shock (poor oxygen and blood circulation), blood loss (internally or externally), anaemia, or hypothermia (cold).
White	Advanced shock (very poor oxygen and blood circulation), severe blood loss (internally or externally) or advanced anaemia.
Blue (cyanotic)	Inadequate oxygenation. May indicate respiratory compromise leading to hypoxia
Small red pinpoints (petechiae haemorrhage)	Coagulation disorder. Could be indicative of poisoning, toxicity or septic shock.
Brick red	Increased perfusion, vasodilation. Early shock, sepsis, fever, hyperthermia (too hot).
Yellow	Hepatic (liver) or biliary disorder and/or hemolysis.
Blue/Grey	Advanced shock – generally seen immediately pre-death, or severe oxygen compromise

To assess the mucous membrane colour in mammals, gently lift the lip of the animal to expose the teeth and gums. Be careful doing this in larger species such as koalas and possums. Only experienced rehabilitators should attempt this procedure on flying foxes due to the increased risk of being bitten. If you do not feel confident in assessing the mouth of an animal, or the animal is particularly aggressive, leave this aspect of the assessment to a vet.

The mucous membranes can also be checked in other locations including the conjunctiva around the eyes, or inside the nose (commonly checked in possums) or lips.

It is not possible to rely on this assessment tool when checking the mucous membrane colour in birds and reptiles as the colour of their mouth/gape varies considerably between species.

Photo Left – Koala

Checking the mucous membrane colour of animals, particularly those that have suffered a traumatic event (such as a road trauma, domestic animal attack) is imperative if you are to perform a thorough assessment.

Credit: Karen Scott

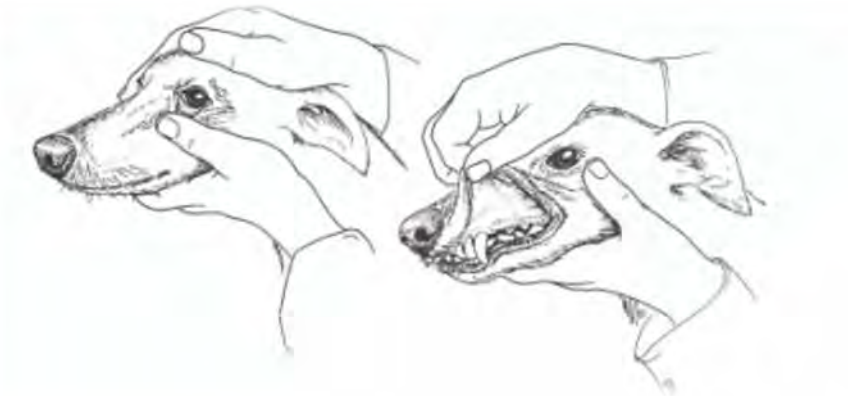


Diagram Above – Inspection of the conjunctiva and oral mucous membranes in a dog. The same technique is used in wildlife. For species where it is difficult to check the mucous membrane in the mouth, you may be able to assess the conjunctiva (eye).
Source: Medical History and Physical Examination of Companion Animals

Capillary Refill Time (Advanced technique)

The capillary refill time refers to the time it takes for the colour to re-appear in the mucous membrane after it has been forced out (through pressure). To assess the capillary refill time, lift the lip of the animal and using your finger firmly push against the gum. The area will go white as blood is forced out of that spot. Remove your finger and take notice of how many seconds it takes for the colour to return to the area. In healthy mammals, the colour should return within 1 to 2 seconds. For animals suffering from shock or internal bleeding, it may take 3 to 5 seconds.

Photo Left – Koala

Checking the capillary refill response is a useful tool to assist with the diagnosis of shock or internal bleeding. This is usually only possible in severely debilitated, anaesthetised or unconscious animals or orphaned animals. Do not attempt to do this on a conscious bat as you are likely to be bitten.

Credit: Karen Scott

Pulse Rate (Advanced Technique)

The pulse rate can be used to indicate the number of times the heart beats in a minute.

For mammals, the pulse rate can be taken by using your index finger and finding the femoral artery on the inside of the thigh.

Count the number of pulses in a 15 second period and multiply that number by four (4) to get the number of beats per minute.

Heart Rate (Advanced Technique)

The heart rate refers to the number of times the heart contracts and relaxes in a minute.

The heart rate is best taken by auscultating the heart over the upper left side of the chest using a stethoscope to listen for a heartbeat. A heartbeat is the sound heard when the heart contracts and the valves in the heart close as blood exits and enters it (simultaneously). This is a useful method for both mammals and birds. Count the number of times the heart beats in a 15 second period and multiply that number by four (4) to get the number of beats per minute.

The normal heart rates for various wildlife species are listed in the Species Information Sheets.

Be aware that it is normal for an animal's pulse and heart rate to be slightly faster than the normal range if it is in a stressful situation (e.g. being handled for assessment).

Respiratory Rate (Advanced Technique)

The respiration rate refers to the number of times an animal performs an inhale and exhale (a respiratory cycle) in a minute.

The respiratory rate can be taken by again counting the number of respiratory cycles in a 15 second period and multiplying by four (4) to determine the number of respirations per minute. The normal respiratory rates for various wildlife species are contained in the Species Information Sheets.

You can listen to an animal's respiration by using a stethoscope or watch the chest rise and fall. Place the diaphragm of the stethoscope over the thoracic cavity – move the stethoscope until you can hear the respirations clearly. When listing to the respiratory rate also take notice of the quality of the respirations. Are the respirations shallow and rapid, slow and deep or normal? Does the animal look distressed? Is the animal breathing with an open mouth? Is there any obvious sound on inhaling or exhaling, gurgling, clicking etc?

Temperature (Advanced Technique)

Ascertaining the body temperature of an animal is an integral part of a thorough examination. An elevated body temperature can indicate that the animal has a fever or has become overheated, whilst a reduced body temperature generally indicates that the animal is suffering from hypothermia.

The normal temperature range varies between species. The Species Information Sheets contain information on the normal body temperature range of common wildlife species.

When ascertaining the body temperature of a mammal, the rectal temperature is the most accurate measure. This is taken by inserting a digital thermometer into the rectum and holding it there until the temperature reading has stabilised. Lubricant (such as K9 Jelly) will help ease insertion into the rectum. Insert the thermometer slowly – do not force it. This is a useful skill for some wildlife rehabilitators to learn but should be learnt under the supervision of a vet or your Species Coordinator. Taking the temperature of male marsupials can be more difficult as you will need to protrude the penis first to ensure the smooth insertion of the thermometer.

Thermometers should be sterilised after use with each animal.

Left – Rectal Temperature

More experienced wildlife rehabilitators should aim to learn to take the core body temperature of mammals as this can be a useful skill when assessing whether the animal is suffering from hypothermia or possible infection.

Credit: Karen Scott

Diagnostic Torch (or pen light)

The diagnostic torch is used primarily to assess the response of the pupils to light. It is also handy for checking the inside of mouths and other hard-to-see areas.

In dark and low light, pupils are dilated. When light begins to hit the eye, the pupils start to constrict (get smaller) to reduce the amount of light entering the eye. Abnormalities that can be seen using the diagnostic torch include:

- pupils that do not constrict
- pupils that do not constrict equally on both sides
- pupils that do not stay centred in the eye (usually these are the result of head trauma)
- pupils that are not round in shape (usually oblong or skewed off to one side)
- cataracts – these appear as white centres in the eye (these animals are blind)
- corneal ulcerations – these appear as blue or white “cloudiness” in front of the eye (return of vision may occur with prompt diagnosis and treatment)

Stethoscope

Auscultation generally refers to listening to various sounds of the heart, lungs and abdomen using a stethoscope. A stethoscope is a useful tool for wildlife rehabilitators to learn to use.

A stethoscope consists of several pieces. The earpieces are inserted in your ears. When inserting, make sure that they are inserted correctly, they should fit snugly in your ear canal. There is a right and wrong way to insert the earpiece, so if you cannot hear anything, turn the earpiece around. Some stethoscopes come with various size earpieces, so use the one which fits you best.

The stethoscope also consists of a diaphragm which is the flat, circular part of the chest piece. This is covered in a thin membrane. The diaphragm is used to listen to high-pitched sounds such as those from the lungs, heart and bowels. This is the part that wildlife rehabilitators will generally use when auscultating the heart and lungs of an animal.

On the opposite side of the diaphragm is the bell. This is a smaller circular piece and is not covered by a membrane. This is used to listen to lower-frequency sounds such as the third and fourth sounds of the heart. This is generally used by veterinary surgeons.

Although you may not initially be able to interpret what you hear using a stethoscope it is an excellent skill to acquire. Listen to the heart and lungs of healthy animals regularly so that you can identify what is normal. This makes it a lot easier to detect when something is abnormal. Alternatively, when your vet finds an abnormal change in the heart or lungs of your animal, ask the vet to allow you to listen to the sound so that you can further your knowledge.

The skill of using a stethoscope and interpreting what you hear is something that takes a lot of experience. You should NEVER aim to diagnose any condition by what you hear with a stethoscope. You are listening purely to identify if anything sounds unusual. It is your veterinarian's role to diagnose the condition in your animal.

You can find educational videos on YouTube which demonstrate the use of a stethoscope on animals.

Left – Stethoscope

A – Diaphragm – flat circular portion of the chest piece covered with a thin membrane.

B – Bell

Source – An Illustrated Guide to Veterinary Medical Terminology (Romich)

Basic First Aid Kit

All wildlife rehabilitators should have on hand basic first aid items so that you can provide emergency care to an injured animal or bird.

A basic first aid kit could include:

Disposable Gloves

Use for cleaning wounds and handling wildlife with diseases.

For cleaning enclosures.

As a Covid-19 precaution when in contact with other people.

Scissors

Small scissors and bandage (blunt) scissors are both handy items to keep in your First Aid Kit.

Tweezers

Plastic and stainless-steel tweezers are handy for feeding some species and for cleaning debris from wounds.

Bandages

Vetwrap® (pictured left) and standard cotton gauze bandages (far left) are both good for covering wounds and stabilising fractures.

Roll of Cotton Wool or Softban®

Use for supporting fractures and wound cleaning.

Sterile non-adhesive dressing

Use for covering wounds. Brands such as Melolin® are available at pharmacies.

Betadine Solution

Use for cleaning wounds.

Available in liquid form (dilute to 5% solution before use) or ointment.

Cotton buds

Long handled cotton buds are available from pharmacies and are good for cleaning wounds and applying topical treatments.

Sterile Syringes

Available in a variety of sizes (1ml, 2.5mls, 5mls, 10mls and 20mls).

Used for administering medication and fluids (orally, subcutaneously and intramuscular).

Needles

Available in a variety of gauges and lengths. Used to administer injections.

Alcohol Swabs

Used to clean the skin before administering injectable medications.

Sodium Chloride for Irrigation

Available in bottles and small plastic vials. Once opened, they are no longer sterile and need to be used within 24 hours or discarded. The 30ml vials are a good option when you only need a smaller quantity.

Sodium Chloride for Injection

Used for administering subcutaneous or intravenous fluids (veterinary procedure) to dehydrated animals. Comes in a variety of sizes including 100mls, 500mls and 1 litre.

Eye Stream® or Refresh®

Used for flushing minor debris from eyes and keeping eyes moist.

Available from pharmacies.

Wound Gel

Non-damaging wound treatments such as Solosite® is available readily from pharmacies and can be used to keep wounds clean pending assessment and debridement by a vet.

Cotton Gauze Swabs

Available in packs of 100 these are good for cleaning wounds. Available from pharmacies.

Tape

Various brands including Micropore® (left) and Leukoplast® (right). Be careful which one you use for which purpose. Some stick very firmly to fur/skin (e.g. Leukoplast) and can be difficult to remove without an adhesive remover.

Glucodin®

Essential part of first aid kit. Used to treat shock in all species.

Hand Sanitiser

Waterless solution used to disinfect hands when soap and water is not available.

As you become more experienced you may wish to include in your kit the following items:-

Diagnostic Torch (or penlight)

Good for checking wounds carefully and assessing pupil response. Available through medical supply stores or penlights are available through most hardwares.

Stethoscope

Used for checking respiratory and cardiac sounds. Available through medical supply stores. Littmans brands are good quality and come in standard and paediatric sizes.

Digital Thermometer

Used to check rectal temperature of animals. Available from pharmacies.

Don't forget a first aid kit for yourself as well in case you get bitten or scratched!

Rescue and Examination Record Forms

Wildcare Rescue and Examination Record forms should be used for each animal that comes into your care. It is recommended you keep a supply of these handy for each species so you have them ready when you need them.

This Examination Record Form will ensure that nothing is missed during the initial and thorough physical assessments and provides a place for you to record your findings. The reverse of the Form contains a Progress Chart where you can record ongoing details of the animal's rehabilitation.

It is useful to take this form with you to any veterinary consultation so that the vet knows the areas you are concerned with and the possible injuries the animal may have sustained.

Use the Progress Chart on the rear of the form to record details of the veterinary consultation, subsequent findings and any medications administered.

Common Injuries, Diseases and Conditions:

including fluid therapy

Adult female koala and joey hit by car being assessed and treated at Australia Zoo Wildlife Hospital.

Credit: AZWH

This section will focus on the most common injuries, diseases and conditions found in **rescued** wildlife and will touch briefly on some of the conditions which may occur during the rehabilitation process. Detailed information on fluid therapy, including fluid types and routes of administration is also outlined.

Please note that this section is designed to provide wildlife rehabilitators with an overview of possible injuries and conditions, how to recognise them and establish how urgently they require veterinary attention. It is not meant to be a comprehensive outline on the treatment of each injury and condition, as this is the role of your wildlife veterinarian and may differ significantly between species and individual animals.

Certain diseases and conditions may be specific to various species and are outlined in more detail in the training manuals for each individual species.

Bearded Dragon in rehab.

Credit: Annette Bird

When an animal arrives in care it may be suffering some degree of shock in addition to an injury or illness/disease. This is a particularly common presentation in orphaned mammals when they are first rescued and requires immediate attention.

Definition

Shock is the body's response to a sudden drop in blood pressure. It can be a life-threatening condition and if left untreated can result in the animal's death. Recognising the signs of shock and understanding the impact it can have on the animal may help save the animal's life.

The fall in blood pressure during a shock event inhibits the delivery of oxygen and energy to the body's organs and may reduce an organ's ability to function normally. The body responds to the effect of shock by constricting blood vessels (reducing their diameter) which results in an increase in blood pressure. This will temporarily reduce some blood flow to certain non-vital organs (e.g. skin, gut and kidneys) in order to maintain blood flow to vital survival organs such as the brain and heart.

There are multiple types of shock that wildlife patients may suffer from – Hypovolaemic shock (low blood volume), Cardiogenic shock (heart conditions), Septic shock (infection based), Neurogenic shock (CNS damage), Anaphylactic shock (allergic reaction) and Physiological shock (acute stress reaction).

Causes

- **Hypovolaemic shock** – low blood volume often caused by acute haemorrhage (bleeding)
- **Cardiogenic shock** – a reduced supply of blood to the body's organs often caused by damage to the heart
- **Septic shock** – toxin release (by an infectious agent) and tissue damage occurring during an infection causes a reduction in blood pressure
- **Neurogenic shock** – damage to the brain or spinal cord can lead to a disruption in the normal pathways that regulate blood pressure
- **Anaphylactic shock** – an allergic reaction that results in a release of chemicals within the body that leads to a drop in blood pressure
- **Physiological shock** – an acute reaction caused by a surge or adrenalin in response to stress, fear and anxiety (e.g. being in contact with humans/predators or near-life threatening event)

Recognising shock

A diagnosis of shock should be based on a physical examination of an animal and consideration of the events immediately prior to rescue (i.e. their history). For example, an animal which has been hit by car or mauled by a domestic animal should always be presumed to be suffering from shock, often multiple types.

Clinical signs of shock may include:

- Pale gums - indicating poor blood supply. May progress to a 'muddy' or bluish colour in severe shock
- Decreased or rapid increase in heart rate (bradycardia and tachycardia respectively) – NB. increased heart rate indicates an effort to improve the delivery of oxygen to vital organs
- Decreased pulse quality – this indicates lowered blood pressure or lowered blood volume
- Prolonged capillary refill time (CRT) - this indicates lowered blood pressure or lowered blood volume and poor circulation
- Altered respiratory rate - shallow or deep, slow or rapid, open mouthed or laboured
- Cold extremities – due to the shunting of blood away from non-vital organs (i.e. skin) to vital organs. Could also be due to low body temperature

- Depression, dullness, and/or lethargy
- Reduced level of consciousness
- Pupil dilation – due to an adrenalin release occurring in physiological shock/acute stress, or due to a lack of oxygen to the brain (either through lack of blood flow, or lack of breathing and oxygen intake)

Be aware that circulating adrenaline may initially mask some signs of shock as its release into the blood stream leads to a short boost in blood flow and energy.

Wildlife are also the masters of disguise and as part of their survival instinct they try to avoid appearing sick or vulnerable at all costs! They mask their symptoms very well, so it is helpful to understand the behaviour/characteristics of the species that you are rescuing.

Treatment

The first line response to shock that a carer can provide includes:

- **Warmth** – ensure that the animal receives GENTLE warmth through the use of heating pads/bags, a heat lamp, or in the case of small orphans, by placing the animal in direct contact with your body (i.e, under your top) to assist with returning its core body temperature to normal
- **Providing a dark, quiet, stress free environment** - ensure the animal is placed in a quiet room away from noises and smells with minimal disturbance
- **Fluid Therapy** (where appropriate) – which may include oral, subcutaneous or intravenous fluids* (see below). Do not administer fluids to an animal until it is warm (unless warm fluids are being administered intravenously). *Should only be administered if you are trained and after consultation with a vet and your Species Coordinator
- **Provide oxygen therapy via a face mask or oxygen tent**

Once supportive care has been started, you should begin see some initial improvements in:

- Heart rate – should slow from very rapid to a more normal range
- Improved respiratory rate – calm and regular breathing
- Improvement in pulse quality, CRT and mucous membrane colour
- Return of consciousness – animal should become more alert and responsible and show normal behaviour such as fear
- If the animal is not improving quickly, veterinary attention should be sought immediately as the animal's condition may progress to permanent brain injury, organ failure or death if the underlying cause of shock is not addressed

Veterinary treatment of shock includes:

- Continued warming the patient using a Bair Hugger® or humidicrib etc.
- Placing an intravenous catheter and administering fluid therapy (e.g. rapid intravenous fluid to immediately increase blood volume/blood pressure then ongoing maintenance fluid therapy)
- Maintaining or establishing a clear airway and assisting with breathing where required (may include providing oxygen through a mask or intubating the patient to ventilate it)
- Administration of emergency veterinary medications e.g. adrenalin, sedatives, anti-seizure medications, analgesics/pain relief etc.
- Controlling bleeding with pressure bandages or through surgical means
- Close and continued monitoring of vital signs
- Further diagnostic investigations to determine the underlying cause of shock

In animals suffering from hypovolemic shock caused by acute blood loss, the source of the bleeding needs to be identified and stemmed as soon as possible. Some animals may require a blood transfusion. Some wildlife hospitals (such as the Australia Zoo Wildlife Hospital) maintain a 'blood bank' of whole blood or plasma from common wildlife species for this purpose.

Fluid therapy

The aim of fluid therapy is to restore tissue perfusion and oxygenation and replace depleted fluid, as well as maintaining ongoing body fluid requirements. Fluid administration is one of the most essential components in the treatment of shock and dehydration. Determining the correct route of administration and type of fluid administered is crucial to its effectiveness and is something a veterinarian will determine. For example, in cases of severe blood loss, the administration of subcutaneous fluids will not restore fluids to the circulation or provide lifesaving blood pressure support as the fluid will not be absorbed from under the skin due to the shunting of blood away from the non-vital (i.e. skin) organs to the heart and brain. Instead, fluids need to be administered intravenously and the type of fluid may be quite different to what may be given subcutaneously (e.g. Colloid fluids, hypertonic saline or whole blood for blood transfusion etc.)

When admitted to a veterinary clinic, a number of laboratory tests can be used to determine the types and volumes of fluids that are required, including:

- Measurement of packed cell volume (PCV) and total protein (TP)
- Measurement of electrolytes
- Measurement of blood urea nitrogen (BUN) and creatinine levels
- Measurement of urine specific gravity

Types of fluids commonly used

- **Crystalloids**: These are fluids that are comprised mainly of water, and usually contain added electrolytes such as sodium chloride. (e.g. 0.9% Sodium Chloride and Hartmanns® solution). If given intravenously, they go directly into the blood stream to immediately increase the volume within the vessels, leading to improved blood volume and circulation to organs within seconds. When given subcutaneously or intraperitoneal, the fluids will slowly be absorbed into the circulation. The subcutaneous method is useful when there is good skin perfusion (i.e. warm patient that still has good blood pressure/circulation) but provides fluid support over hours rather than minutes. The intraperitoneal method may provide more rapid absorption into the circulation but should only be administered by a vet and is not as desirable as intravenous therapy.

- **Colloids**: These are fluids that contain protein or starch molecules that are dissolved in water. (example - Gelofusine®). Because they contain large molecules of protein or starch they will stay in the circulation longer - from one to four hours depending on the solution that is used. These fluids can only be given intravenously and are best in situations where there is a loss of blood or severe tissue damage.

Causes

Conditions that lead to dehydration, or the loss of water and fluids from the body include:

- Diarrhoea
- Vomiting
- Prolonged anorexia
- Haemorrhage/bleeding
- Chronic illness
- Renal disease
- Diabetes
- Fever

Indications for fluid therapy

- Shock
- Dehydration
- Perioperative use – to optimise cardiac/pulmonary function, shorten post-operative ileus, and prevent renal ischemia (due to low blood perfusion)
- Provide supportive care to patients not taking fluid orally

Precautions

Do not give fluid to an animal with paralysis that is unable to urinate voluntarily without expressing the bladder first (bladder expression is an advanced technique and should only be attempted by a veterinarian)

- Do not give fluid to a joey with a full bladder or who is unable to toilet on its own, toilet first to enable it to empty the bladder
- Do not give fluids to a cold animal
- Do not give oral fluids to an animal who has no swallowing reflex or is too weak to hold its head up
- Do not give fluid to an animal with head trauma or suffering oedema without veterinary consultation

Routes of fluid administration

- Oral – fluid (drinking water or oral electrolyte solutions) is provided by mouth. Can be offered by syringe or lapped from a bowl if the animal is alert and conscious
- Subcutaneous – specifically formulated, sterile veterinary electrolyte solutions (e.g. crystalloids) are injected in boluses under the skin using a sterile needle and syringe
- Intravenous - specifically formulated, sterile veterinary electrolyte solutions (e.g. crystalloids, colloids or other medically formulated fluid solutions) are infused into the vein through a preplaced catheter/cannula at a designated rate per hour. This can be administered in small boluses but is often a constant rate infusion administered through a fluid pump
- Intraosseous - specifically formulated, sterile veterinary electrolyte solutions (e.g. crystalloids) administered into the medulla (core) of a long bone (e.g. leg) through a preplaced specifically designed intraosseous catheter/cannula. This method is reserved for extreme cases where intravenous access is not available
- Intraperitoneal - specifically formulated, sterile veterinary electrolyte solutions (e.g. crystalloids) are transfused into the abdominal/peritoneal cavity through a sterile needle and syringe. This is less commonly used then subcutaneous or intravenous routes of administration

Intravenous, intraosseous and intraperitoneal are advanced veterinary techniques and should not be attempted by unqualified wildlife rehabilitators.

Never administer fluids into the muscle (intramuscular), as significant muscle damage can occur when large volumes of fluid are injected into the muscle mass.

The animal body is made up of about 70% water (and blood is over 90% water). The body needs this vital water to maintain enough blood volume and produce other fluids critical to proper body function. Along with these fluids, the body also needs electrolytes in the form of salts such as potassium and sodium - normally found in blood, other fluids, and cells. Vital organs such as the kidneys, brain, and heart simply cannot function without a certain minimum requirement of water and salts.

Dehydration occurs when the level of water within the body decreases. A significant proportion of wildlife patients admitted into care will be suffering from some degree of dehydration. It is imperative that you are able to confidently determine the degree of dehydration the animal is suffering from and then seek assistance from your veterinarian or coordinator accordingly. Obtaining a complete and accurate history on the animal may help with determining the degree of dehydration the individual is suffering from when it arrives into care.

Correcting dehydration is critical when dealing with sick, injured or orphaned animals. Failing to adequately rehydrate the animal will result in poor perfusion (blood flow) to vital organs such as the kidneys and brain, reduce the digestion of milk/food and severely compromise their recovery.

The following section outlines the levels of dehydration an animal may suffer from and suggests methods for correcting them. Correcting mild to moderate dehydration is something that can be performed by a carer. Serious degrees of dehydration, or those associated with other medical conditions require urgent veterinary attention.

Recognising dehydration

The following is a general guide designed to assist with classifying the degree of dehydration an animal may be suffering from. Once the degree of dehydration is determined, a decision can be made on how best to manage or rectify it through rehydration techniques. It is important to note, that other factors may need to be considered when deciding upon the appropriate method of re-hydration, such as whether the animal may be suffering from serious injuries (e.g. internal bleeding, head trauma, myopathy) or disease.

Degree of Dehydration	Clinical signs/presentation	Suggested rehydration method
MILD DEHYDRATION	• Subtle loss of skin elasticity – skin tents for less than 1-2seconds • Mouth/oral mucous membranes slightly dry and tacky • Eye(s) slightly sunken • Any milk dependent joey whose mother has been dead for more than four hours.	Oral fluid therapy

Degree of Dehydration	Clinical signs/presentation	Suggested rehydration method
MODERATE DEHYDRATION	• Marked loss of skin elasticity – skin tents for more than 2 seconds • Mouth/oral mucous membrane dry and tacky • Sunken eye(s) • Eyes dull • Decreased urination • Delayed capillary refill time (>2-3 seconds) • Lethargy	Subcutaneous fluid therapy. May require multiple administrations over 24hrs. Follow with oral therapy once improving
ADVANCED (SEVERE) DEHYDRATION	• Skin fails to flatten when tented • Eyes well sunken into head • Very delayed capillary refill time (>3 seconds) • Weak/lethargic • Weak pulses • Not urinating • Unresponsive	Intravenous fluid therapy – requires immediate veterinary attention

Refer to the 'Species Information Sheets' for specific information on signs of dehydration in specific species.

Precautions and Tips

- Do not administer non-steroid anti-inflammatory drugs (NSAID's) to animals suffering from severe dehydration without veterinary consultation
- Use white towels and pouches initially to monitor urine output and colour. This helps to identify signs of blood being passed directly from the cloaca/vent or in the urine
- Fluids (by any method other than warm fluids administered intravenously) should not be provided to any animal until the animal is warmed. Ideally, the animal should be placed into an intensive care unit (humidicrib) or placed into a heated room to help ensure that warmth is provided uniformly. Other methods of providing heat include the use of hot water bottles, electric heat mats and heat lamps. (Refer to Section on Providing Warmth for more detailed information)
- Most animals will need to be warmed for 30 to 60 minutes before their preferred body temperature is achieved. Animals should be warmed slowly to prevent overheating. Large species may require additional time as will those suffering from hyperthermia

Below is a general guide of **preferred body temperatures** for various species. These temperature ranges may vary depending upon other factors such as the size of the animal, age, feather or fur coverage, body condition and other conditions such as hypothermia that the animal may be suffering from.

Birds	38 - 40°C
Reptiles	30 - 32°C
Marsupials	36 - 38°C
Amphibians	26°C
Mammals	37.5°C
Monotremes	28°C
Marine Turtles	22 - 24°C

Note: Preferred body temperature refers to their CORE body temperature (not the ambient temperature in their surroundings).

(Refer to Species Information Sheets for more specific information on species).

Infant koala who came into care very dehydrated. She has been placed on intravenous fluids (note the i/v port on her bandaged right arm).

Credit: Karen Scott

Re-hydration methods

1 - ORAL RE-HYDRATION

Animals that are only mildly dehydrated should be offered fluids orally. They can be offered orally by way of a water bowl, syringe or crop needle or for orphaned joeys by a bottle and appropriate teat.

Providing fluids orally is the preferred option if the animal is willing and able to drink.

Advantages and Disadvantages of Oral Re-Hydration

Advantages	Disadvantages
• Simple, cheap and painless • Good for supplying daily maintenance requirements – particularly if animal is drinking voluntarily • No specialised equipment • No special training required • Tap water is an easily available option	• Not useful as the only methods of rehydration in animals suffering from moderate or severe dehydration. • Only fluids formulated specifically for oral administration can be administered orally • Will not provide adequate treatment for shock in critically sick or injured wildlife

Fluids specifically formulated for oral use:

- Spark®
- Lectade®
- Glucodin®

The glucose in these products will generally satisfy the immediate and short-term energy demands of patients affected by hypothermia, exhaustion and anaemia. If eating well there is no need to continue fluids unless there is a continued loss. Follow the directions on the packaging to make up an oral solution for administration.

Birds

Oral fluids such as Spark® or Glucodin® can be offered in a dish if the bird is well enough to drink. Oral fluids are not suitable if the bird is critically ill.

If not, use a 1ml syringe or eye dropper and place a drop of fluid on the edge of the bird's beak towards the base, allowing it to drink it. If the bird is thirsty, it should eagerly take the fluids.

If the bird refuses to take fluids orally, it may be necessary to place the fluid directly into the crop, lower oesophagus or proventriculus directly with either a crop needle or feeding tube. This is an advanced technique and only appropriately trained and experienced rehabilitators should administer fluids via these methods as there is a high risk of the bird aspirating the fluid into its lungs.

When providing oral fluids to birds, ensure that the fluid is warmed to 38-39°C (the equivalent of their body temperature).

Mammals – Orphans

Use an appropriately sized teat and bottle/syringe and offer oral fluids in the same way that you would use a milk replacer. If you do not have an appropriate teat, use a 1ml syringe and/or cannula to provide oral fluids very slowly (only 0.1mls at a time) ensuring that the animal is swallowing.

Hold the animal in a slightly tilted position with the mouth and nose pointed slightly downwards so that any excess fluids can drain out of the mouth and not into the lungs.

If you are not confident with feeding orphaned mammals, then you should transfer the animal to an experienced mammal carer as soon as possible. Mild dehydration in young animals can increase to a moderate level of dehydration in a matter of hours and can have a detrimental effect on their survival rate.

Mammals – Adult

Use a syringe (1ml or 2.5ml) syringe to offer oral fluids by placing the syringe in the side of the animal's mouth. Be careful not to get bitten! Having an idea of the anatomy of the species' head and dentition will help you establish the best place to position the syringe. For example, marsupials generally have a gap between their front incisors and their molars which can guide the position of the syringe.

Alternatively, place a bowl of fresh water in the cage with the animal so that they can drink voluntarily. Be aware that most wild animals will not immediately recognise a bowl as being a source of water or food. Therefore, it can be difficult to know if an animal is drinking water like this. Monitor the animal closely and offer water by syringe if you do not feel it is drinking from the bowl.

If the mammal is an herbivore and you are offering browse/leaf, you can also spray the leaf with fresh clean water in an effort to provide additional fluids.

Reptiles

Mildly dehydrated reptiles can be given oral fluids. A water and Glucodin® solution (1/2 teaspoon to one cup of water) can be offered in a dish if the reptile is well enough to drink on its own. Otherwise, a syringe can be used. Some lizards will lap from the end of the syringe, while with others may need to place the syringe in the side of their mouth. Reptiles are unable to cough and can easily inhale liquids administered incorrectly. Do not squirt liquid into their mouth – give oral fluids slowly and make sure that the animal is swallowing regularly. Your ability to give oral fluids to reptiles will depend on the species you are working with. In some species you may not be able to open their mouth to administer fluids via this route. Alternatively, an easy and effective way of re-hydrating a reptile with mild dehydration is by placing it a suitable container and filling it with enough luke-warm water to cover about one-third to one-half of their body. The water must not be too deep as they may drown. Leave the reptile for up to half an hour. Using this method, they may voluntarily drink the water they are submerged in. You may need to replace the water if it starts getting cold. This is particularly effective for turtles, and ideal for snakes which usually do not drink a large volume of water.

If the reptile is unable to keep its head above water due to weakness or injury, ensure that you support the animal's head or lower the level of water in the container. Do NOT leave the reptile unattended!

Frogs

The easiest method to re-hydrate a frog is to soak them as outlined above for reptiles. Soak in water for 60 minutes 1 to 2 times a day or leave for 24 hours in very shallow water (below level of the mouth). Fresh, oxygenated carbon filtered water or tank (rain) water is best, or boiled water which has been allowed to cool.

2 - SUBCUTANEOUS

If the animal is moderately dehydrated, then it is more appropriate for the animal to be re-hydrated by way of subcutaneous fluids. The process of providing subcutaneous fluid involves injecting specially formulated sterile fluids underneath the skin. This is a useful method of fluid therapy where the animal is not able or is unwilling to take fluids orally.

Administering subcutaneous fluid is a specialised procedure and only wildlife rehabilitators that have specifically been trained in this method should attempt to perform it.

Advantages and Disadvantages of Subcutaneous Re-Hydration

Advantages	**Disadvantages**
• Most practical method of fluid therapy for wildlife rehabilitators to use in critically sick and injured wildlife • Minimal equipment required • Equipment relatively cheap • Can save an animal's life • Can be a relatively rapid way to correct dehydration.	• Not suitable for severely dehydrated animals • Can only administer relatively small volumes at one time • Absorption rate can be slow • Administration can be painful and stressful (if not anaesthetised) • Risk of skin infection or skin slough • Wildlife rehabilitators need to be trained to administer correctly

You should NOT attempt to do this unless you have been specifically trained to do so and your care group has authorised you to undertake this procedure. It is preferable that a veterinarian administer fluids subcutaneously.

Recommended placement of subcutaneous fluid therapy is provided in the Species Information Sheets.

3 - INTRAVENOUS

If the animal is severely dehydrated or is in an advanced state of shock, then intravenous fluids are more appropriate.

Intravenous fluids therapy is the process whereby specially formulated sterile fluids are injected directly into the venous system (into the vein).

Intravenous fluid therapy is an act of veterinary science and should not be undertaken by wildlife rehabilitators. In this situation, most veterinarians will require that the animal be left at the vet surgery while the fluids are being administered. Animals requiring intravenous fluids are best placed in a 24-hour wildlife hospital.

Advantages and Disadvantages of Intravenous Re-Hydration

Advantages	**Disadvantages**
• Rapid correction of dehydration or low blood pressure via administration of fluids directly into the vein. Large volumes can be delivered • Specialised fluids (e.g. plasma and blood products) can be administered • Ideal for treating severe shock • Essential for treating myopathy	• Advanced technique – outside the capabilities of wildlife rehabilitators (requires a veterinarian) • Intravenous access not easy in some wildlife species • Specialised equipment required • Risk of over-hydration • Risk of patient interference • Small risk of adverse side-effects (e.g. phlebitis, thrombophlebitis, bacteraemia, thrombosis)

4 - INTRAOSSEOUS

In a severely dehydrated patient, or one where venous access is not available, veterinarians may sometimes elect to provide fluids via the intraosseous route. This is the process where fluids are administered into the medullary cavity (core) of a bone (generally the ulna or tibiotarsus).

This is a veterinary technique and not suitable for wildlife rehabilitators to perform under any circumstances.

Advantages and Disadvantages of Intraosseous Re-Hydration

Advantages	Disadvantages
• Useful when venous access is unavailable (e.g. animals with collapsed veins) • Useful in small animals • Provides direct access to a vascular space	• Specialised veterinary procedure – not suitable for wildlife rehabilitators to perform • Requires special equipment (e.g. intraosseous needles) • Needles are expensive

5 - INTRAPERITONEAL

Intraperitoneal fluid therapy may be chosen by a veterinarian when venous access is unavailable. It involves the injection of specially formulated sterile fluids directly into the intraperitoneal (abdominal) cavity.

This is an advanced technique and should only be undertaken by a veterinarian. It requires an excellent understanding of the anatomy of the species in question to avoid potentially damaging the abdominal organs.

Advantages and Disadvantages of Intraperitoneal Re-Hydration

Advantages	Disadvantages
• Suitable for small mammals where intravenous access may be difficult • Peritoneum (abdominal lining) is highly absorptive • Allows you to deliver large volumes over a short period of time • Allows delivery of relatively large volumes of warmed fluids in a bolus to rapidly warm the patient	• Specialised veterinary procedure – not suitable for wildlife rehabilitators to perform • Should only be used on animals that are mildly dehydrated • Cannot use in birds due to the presence of air sacs • Not effective when the animal is suffering from shock, ascites, peritonitis or abdominal sepsis • Risk of infection • Risk of damaging abdominal organs

HOW MUCH FLUIDS TO GIVE

Effective correction of dehydration depends on a number of factors:

- How dehydrated the animal was to begin with
- Any ongoing fluid losses (through bleeding, diarrhoea etc.)
- Type of illness the animal is suffering from
- Whether the animal is eating or drinking on its own

It is prudent to assume that most animals coming into care are suffering from some level of dehydration. Most may also be suffering from some degree of shock. For the purposes of initial fluid replacement, calculate the fluid requirement for the animal based on a 10% level of fluid deficit. Be aware that if the animal has suffered bleeding or other forms of large fluid losses then the deficit will be higher, and those animals will likely need veterinary attention.

The first step in working out a fluid plan is to obtain an accurate weight of the animal. Once you have an accurate weight, add 10% onto the weight (to allow for the percentage of dehydration).

Terminology:

Replacement fluid volume is the amount of fluid required to replace either 50% or 25% of the fluid deficit (assuming a 10% deficit) and is calculated by body weight (BW)

Maintenance fluid volume is the amount of fluid required to maintain the normal fluid requirements of an animal on a day-to-day basis. It is calculated at 5% of body weight (BW) for this exercise.

For example:

If a wallaby joey is 800grams when weighed – add on 10% (80 grams) to the body weight to calculate what the joey's weight should be when it does not have any fluid deficit. This means its actual weight should be 880 grams when not suffering from any fluid deficit.

Fluid replacement should be staged over 2-3 days. Therefore, work out a fluid plan as follows.

DAY 1 (First 24 hours)

The aim of the first 24 hours is to correct 50% of the fluid deficit (subsequent days will be corrected at 25%). This is calculated as BW x 10% x 50% = 880 x 10% x 50% = 44mls

We also need to ensure that the 'maintenance fluids' (i.e. the fluids that the animal needs maintain hydration) is provided in addition to this. Normal fluid maintenance requirements for animals can vary depending upon the species but if we say for this purpose that it is 5% of their body weight each day.

Calculation: The wallaby joey will need to be provided with 44mls of fluids plus 44mls (5% of 880g) = total 88mls in the first 24 hours to fulfil the 50% of fluid replacement and 5% maintenance requirement rule.

DAY 2 (24 to 48 hours)

On day two we need to provide 25% of the fluid deficit, plus the maintenance rate.

Calculation: The wallaby joey will need to be provided 22mls of fluid (BW x 10% x 25%) plus 44mls (5% of 880 grams) – total 66mls required for the day

DAY 3 (48 to 72 hours)

On day three we will need to repeat the calculation from day two.

In summary:

Wallaby – 800 grams with estimated 10% fluid deficit = corrected weight 880 grams
Initial fluid replacement required – 10% of 880grams = 88 mls
Maintenance fluid required – 5% of 880 grams = 44 mls
Fluid plan:

Day 1	Replacement (44mls) + Maintenance (44mls)	=	88mls (divided over 5 to 6 feeds)
Day 2	Replacement (22mls) + Maintenance (44mls)	=	66mls (divided over 5 to 6 feeds)
Day 3	Replacement (22mls) + Maintenance (44mls)	=	66mls (divided over 5 to 6 feeds)

Note: Remember milk replacer is a FOOD source. Milk should not be factored into the equation when calculating the amount of fluid that an animal has drunk.

Chart to calculate amount of fluids for dehydrated animals (based on 10% fluid deficit)

Source: Dr Anne Fowler (Advanced First Aid for Marsupials)

Body Weight (g)	**Day 1 (mL) Replacement (BW x 10% x 50%) + Maintenance (BW x 5%)**	**Day 2 and 3 (mL) Replacement (BW x 10% x 25%) + Maintenance (BW x 5%)**	**Ongoing Maintenance (BW x 5%)**
100	10	7	5
150	15	11	7.5
200	20	15	10
250	25	18	12.5
500	50	37	25
750	75	45	37.5
1000	100	75	50
1250	125	93	62.5
1500	150	112	75
1750	175	132	87
2000	200	150	100
2500	250	188	125
3000	300	225	150
3500	350	263	175
4000	400	300	200
4500	450	338	225
5000	500	375	250

Above – Red Necked Wallaby joey

Subtle loss of skin elasticity can be gauged by the "pinch" test. This is usually performed on the back of the neck/shoulder area. The level of dehydration may be indicated by the length of time that the skin remains tented. Some species, particularly young macropod joeys have excess skin in this area so this method is not always reliable. You should always look for other signs of dehydration as well.

Credit: Karen Scott

Above – Agile Wallaby joey

This joey came into care extremely dehydrated and very weak and lethargic. He was found with his mother who had been dead for several days. Note the folds of skin along his back that indicate a high level of dehydration. His skin felt like tissue paper – there was little moisture left in his skin. The joey was estimated to be severely dehydrated. He was placed on intravenous fluids for 3 days and made a full recovery.

Credit – Karen Scott

Definition

Hypothermia is a condition in which an animal's core body temperature falls below its normal parameters. It is the opposite of HYPERthermia, the condition which causes heat exhaustion and heat stroke. Hypothermia can cause serious effects on the cardiovascular, respiratory, neurological and metabolic systems.

Hypothermia can be classified as either a 'primary' or 'secondary' condition.

1. Primary hypothermia (or accidental hypothermia) is caused by excessive exposure to low environmental temperatures.
2. Secondary hypothermia may result from shock, disease, trauma, surgery or some drugs/medications.

Examples where animals may be predisposed to primary hypothermia include:

- Sick or injured animals that are exposed to cold weather
- Animals that have been trapped in cold extremes (such as in a water source etc.)
- Young joeys or baby birds that are unable to thermoregulate – this often occurs during the orphaning process when they lose the warmth of their mother/parent

Recognition

Rectal temperature is one of the most accurate methods for identifying hypothermia. Carers should have some basic knowledge of the normal core body temperature in animals. Wildlife rehabilitators that are not confident in measuring the rectal temperature of an animal should take the animal to a vet. Please note that if the animal's temperature is too low it will not register on a normal thermometer. (Refer to Species Information Sheets)

Signs that may indicate that the animal is hypothermic include:

- Cold skin or gums
- Pulse (slow to none)
- Breathing (slow to none)
- Mental status (responsive to unconsciousness)
- Low rectal temperature

Treatment

The treatment of a hypothermic animal includes:

- Providing gentle warmth for re-warming
- Avoiding any further exposure to cold
- Monitoring the animal's core body temperature on a regular basis

- Take the animal to a veterinarian where it can receive appropriate care and a full assessment of its health and injuries.

NB. Do not administer cold fluids to an animal that is hypothermic

In order to treat a hypothermic animal appropriately, you need to determine what stage of hypothermia the animal is at. Once this has been determined, the decision can be made on the warming technique that should be used.

The Stages of Hypothermia:

In stage 1 (Mild hypothermia):

- The animal's body temperature drops by 1-2°C below its normal body temperature
- Mild to strong shivering may start to occur
- The animal loses some of its normal limb function as they become numb
- Blood vessels under the skin constrict, lessening heat loss to the outside air as the animal's body shunts blood to its vital organs
- Breathing becomes quick and shallow
- Goose bumps may form, raising body hair and feathers on end in an attempt to create an insulating layer of air around the body

In stage 2 (Moderate hypothermia):

- The animal's body temperature drops by 2-4°C
- Shivering may become more violent and uncontrollable
- The animal's movements are slow and laboured, and can be accompanied by a stumbling pace and mild confusion, although the animal may still appear to be alert
- Loss of muscle coordination becomes more apparent as the animal loses control of its limbs
- Blood vessels under the skin and on the extremities contract further as the body focuses its remaining resources on keeping the vital organs warm. The animal will become pale
- Chin, bill, ears, fingers and toes may become blue

In stage 3 (Severe hypothermia):

- The animal's body temperature continues to drop
- Shivering usually stops as the body conserves energy
- The animal will have difficulty vocalizing, brain activity will be sluggish
- The animal will lose its ability to use its limbs
- Exposed skin may become blue and puffy
- Muscle coordination becomes very poor, walking becomes almost impossible
- Will exhibit incoherent/irrational behaviour
- The animal's pulse and respiration rates will usually decrease significantly, but fast heart rates (ventricular tachycardia, atrial fibrillation) can occur as the animal goes into a state of shock
- The major organs will begin to fail
- Clinical death occurs

Warming Techniques:

Mild hypothermia:

Prevent further heat loss by insulating the animal from the ground, protecting it from the wind, covering the head and neck area, and moving the animal to a warm environment (i.e. inside). Re-warming the animal using insulated heat packs to high heat loss areas such as the head, neck, between the legs, and the side of the chest wall, as well as keeping it covered with warm towels or blankets will all help to prevent more heat loss. For some species, you can also consider a warm bath. Regularly check the animal's core body temperature to ensure that you do not overheat the animal.

Moderate hypothermia:

For moderately hypothermic animals, a more aggressive approach is required. Provide external warmth by using hot water bottles, warm blankets, heat lamps, intensive care units (humidicribs) or forced air warmers. Heat sources should be aimed at the trunk (body) of the animal and over major blood vessels such as the inside of the legs and chest instead of the extremities. The extremities will eventually warm once blood perfusion is restored.

You can also immerse the animal in a bath of warm water provided that the animal can be thoroughly dried afterwards. Continue the warming efforts until the animal's core temperature is restored to normal. When using external sources for warmth, the animal should be closely monitored for signs of overheating. Ensure that sources of heat do not come into direct contact with the skin which can cause burns.

Severe hypothermia:

An animal that is in a severe hypothermic state can easily be mistaken as dead once they slip into an unconscious state and the heart drops to dangerously low levels.

Animals in this state should be considered a veterinary emergency and should be immediately taken to a vet who may administer warm intravenous fluids and peritoneal lavage in addition to external warming methods.

Definition

Hyperthermia is an acute condition which occurs when the animal's body produces or absorbs more heat than it can dissipate. It is most commonly induced by excessive exposure to heat, such as an unmonitored heat pad or unprotected housing/enclosures but may also be induced if an injured animal is unable to escape from the heat of the day. The thermoregulating mechanisms of the animal (including panting, sweating, evaporative heat loss) eventually become overwhelmed and it is unable to effectively deal with the heat, causing the animals body temperature to climb uncontrollably.

Hyperthermia is life threatening and is a veterinary emergency.

Hyperthermia is the opposite of Hypothermia.

Recognition

Animals with a body temperature above 40°C are in a life-threatening situation. At 41°C brain death begins, and at 45°C death is nearly certain. Internal temperatures above 50°C will cause rigidity in the muscles and certain, immediate death.

Birds have a higher core body temperature than mammals, with the normal range being between 38°C and 42°C. As such, temperatures over 46°C will be life threatening. Temperatures over 50°C will certainly result in death.

Severe hyperthermia may come on suddenly, but usually follows a less-threatening condition commonly referred to as heat exhaustion or heat prostration where the animal will appear lethargic, confused and may be unresponsive to stimuli.

One of the body's most important methods of temperature regulation is evaporative cooling by means of perspiration and evaporation. Panting performs a similar function by expelling hot air from the body that dissipates into the cooler atmosphere. . When an animal is dehydrated, there is less available water for perspiration, resulting in less available evaporative cooling and thus an inability to effectively cool.

Many native animals have a limited capacity to sweat. Instead, they may rely on other forms of evaporative cooling such as panting and covering their limbs in saliva (which is then evaporated leading to cooling in a similar way to sweating). Therefore, if an animal is unresponsive or paralysed its naturally employed cooling abilities such as the use of saliva, ability to access to water or shade seeking aren't possible and the animal may overheat rapidly.

Treatment

Hyperthermia is treated by cooling the body by using tap water, a fan and/or cool intravenous fluids. Placing the animal on cool wet towels and changing the towels frequently will help.

Ice packs can also be used but should not be placed directly on the skin; wrap them in a towel first. Position the icepacks over the areas where the large blood vessels of the body lie i.e. between the upper thighs, upper arms and against the chest. Do not apply to the extremities as this will cause the smaller blood vessels that supply the limb and skin to constrict and reduce the ability for the animal to cool. Monitor the animal's temperature every few minutes. Once they have cooled to within 1°C above their normal core body temperature discontinue the cooling mechanisms, towel dry the animal and monitor their temperature closely for the next few hours.

Animals that have suffered a severe level of hyperthermia should be assessed by a veterinarian.

Definition

Hypoglycaemia is a condition in which the blood sugar drops to an abnormally low level. The brain requires sugar for normal function, and unlike many other organs, the brain has a very limited ability to store glucose. The brain is the organ that is predominantly affected when blood glucose gets too low.

Wildlife can suffer from hypoglycaemia after being involved in a trauma-related incident, are suffering from illness or septicaemia, or when they are in poor body condition. Infant animals are predisposed to developing hypoglycaemia because they have less ability to store and mobilize glucose, compared to older animals. Infant animals need frequent meals to prevent a hypoglycaemic crisis.

Recognition

The first clinical signs of hypoglycaemia may include:

- lethargy
- weakness
- sleepiness/sedated state

If left untreated, symptoms can progress to include:

- incoordination
- seizures
- nervousness
- tremors
- hunter
- unconsciousness
- coma
- death

Treatment

Mild cases of hypoglycaemia can be treated by offering oral glucose (Glucodin®). Dissolved glucose powder or syrup is absorbed quickly through the mucosa once placed into the side of the mouth. It is not necessary for it to be swallowed. The response to glucose administration is fairly rapid and you should see a change in the animal's demeanour within 15-20 minutes. Mild forms of hypoglycaemia can also be treated by offering food (if willing and able to eat) however you should assess the animal first to ensure that providing food is appropriate (e.g. evidence of injuries, the animal is not cold or dehydrated).

Severe hypoglycaemia is a veterinary emergency and involves the rapid administration of specialised glucose fluids by intravenous injection.

A proper assessment and clinical workup are essential in all native animals that present unconscious or moribund. Hypoglycaemia (in addition or as a result of hypothermia) is often a contributing factor to an animal's dull demeanour and can be addressed with the prompt administration of glucose.

Definition

Hyperglycaemia is a condition in which the blood sugar is higher than normal.

Recognition

Hyperglycaemia can be detected by measuring sugar levels in blood and urine.

Hyperglycaemia is the body's response to a disruption in the glucose management pathway in the body. Hyperglycaemia results from issues with insulin regulation, the chemical that helps move glucose into the body's cells for energy. Hyperglycaemia causes mild to severe symptoms and can eventually lead to coma and death if undiagnosed.

Signs

- Excessive drinking
- Excessive urination
- Weight loss despite having a good appetite
- Weakness
- Cataracts (results from persistent longer-term hyperglycemia)

Causes

- A diet rich in sugars and highly soluble carbohydrates. (e.g. fruit included in folivores' diets)
- Obesity
- Trauma (temporary elevation)
- Certain illnesses e.g. diabetes mellitus or pancreatic disease
- Stress (leading to ongoing glucocorticoid elevation)
- Fight/flight response (usually temporary elevations)

Treatment

Animals with any of the above symptoms should be assessed by a competent wildlife veterinarian. Wildlife rehabilitators should not diagnose this condition; it is one that must be diagnosed by a vet.

Most cases of hyperglycaemia are temporary and may be corrected through husbandry and diet modifications. Cases of persistent hyperglycaemia, or that caused by conditions such as diabetes mellitus may require medical treatment (e.g. insulin) by a veterinarian.

Definition

Anaemia is defined as a reduction in the amount of red blood cells in the circulation below normal levels. Red blood cells contain haemoglobin, a red pigment which gives blood its colour. The job of haemoglobin is to carry oxygen around the animal's body. When red blood cells and therefore haemoglobin are low the blood fails to supply the tissues and organs with sufficient amounts of oxygen. As a response, the lungs and heart have to work harder in an attempt to transfer more oxygen into the blood stream and pump it to the oxygen deprived tissues.

Recognition

Signs include:

- Pale mucous membranes
- Weakness
- Difficulty breathing or increased respiration rate
- Increased heart rate
- Lack of coordination

Causes

External blood loss (e.g. through trauma or heavy infestation of blood feeding insects – ticks, mosquitoes, fleas etc)

- Internal bleeding (from trauma or a tumour)
- Diet low in iron
- Diet low in vitamin B12 or folic acid
- Blood diseases such as leukaemia
- Bone marrow diseases that stop the proper production of red blood cell precursors
- Infection that causes blood loss or leakage into the body
- The consumption or destruction of red blood cells within the circulation (through immune responses and some blood parasites)

Treatment

Treatment will depend upon the cause of the anaemia. Anaemia can be a veterinary emergency. An accurate diagnosis of the cause is essential.

Treatment of anaemia can sometimes be through diet adjustment/supplementation by may require medications, fluid therapy or a blood transfusion. Conditions such as leukaemia or bone marrow disease cannot be treated and euthanasia is an appropriate outcome.

Definition

Malnutrition refers to deficiencies, excesses, or imbalances in the intake of energy and/or nutrients. It may be an intermediate stage to starvation.

Starvation is a long-continued deprival of food and its morbid effects.

Recognition

Intermediate stages of malnutrition/starvation include:

- Hunger
- Weakness
- Loss of body weight
- Decreased muscle power and energy

Late stages of starvation include:

- Reduction or complete loss of milk yield (lactation)
- Cessation of defecation and drinking
- Emaciation
- Loss of skin turgor (without dehydration)
- Weakness
- Slow heart rate
- Hypothermia

Causes

Any animal that presents malnourished should receive a full veterinary workup to try to establish the cause of the malnutrition.

Malnutrition is a **symptom** of an underlying condition, either injury, disease or husbandry/nutritionally related – it is not a disease/condition in itself. There is no point in simply treating an animal for malnutrition without first establishing the cause.

A number of factors may cause malnutrition/starvation including:

- An injury that has prevented the animal from feeding normally
- Disease that has impacted on their ability to feed normally
- Weather conditions – during long periods of drought or heavy rain some species may find it difficult to find sufficient food. For example, during long periods of heavy rain, there is no nectar in flowers and therefore nectar eating birds may succumb to malnutrition
- Habitat disturbance – during extensive land clearing animals may be unable to find sufficient food and shelter and may lose condition quickly due to both the lack of food and stress
- Entrapment – the animal may have been trapped in a building or yard without sufficient access to food
- Young animals that are dependent upon their parent(s) and who have not been able to provide them with sufficient food
- Overburden of internal parasites – these animals may be eating sufficient food but the effects of the parasites is not allowing for body weight to be maintained

Treatment

Your veterinarian can assist with diagnosing the cause of the malnutrition.

Obtaining a full and accurate history of the animal can assist the veterinarian in determining a prognosis.

If the veterinarian diagnoses an underlying disease or injury, then the prognosis will depend upon whether that disease/injury is treatable and the extent of the malnutrition.

Your veterinarian may use all or some of the following diagnostic measurements to attempt to try to find the underlying cause:

- Full clinical examination
- Radiographs (to check for fractures)
- Ultrasound (to check for reproductive tract disease, gastrointestinal disease or presence of foreign objects in GI tract)
- Faecal test (to check for parasites or infection)
- Blood tests (to check for infection and/or disease)

Malnourished Agile Wallaby – note the protruding pelvic bones, hollow abdomen and thigh areas.

Definition

Septic shock is defined as an acute circulatory failure and persistent arterial hypotension (despite volume resuscitation) associated with sepsis.

Sepsis is a clinical syndrome caused by infection and the host's systemic inflammatory response to it.

Septic shock is a life-threatening reaction to a severe infection. Death can occur within a few minutes of the first noticeable change in an animal's demeanour. During septic shock, the body's tissues and organs are not perfused with blood and oxygen sufficiently. As the blood pressure drops many vital organs begin to malfunction because of inadequate blood flow.

Septic shock can be caused by bacteria, a virus, protozoa or fungi. Toxins that are released by the bacteria or fungus can cause tissue damage and may lead to low blood pressure and poor organ function. Toxins can also induce a strong inflammatory response in the animal which contributes to metabolic changes associated with septic shock.

Septic shock is a veterinary emergency.

Causes

- Severe bacterial, viral, fungal or protozoal infections
- Infected wounds
- Diseases, including pneumonia, gastroenteritis/severe dysbiosis or urinary infections
- Infections in animals with compromised immune system e.g. unfurred or just furred infants
- Recent surgery or a medical procedure (predisposing factor)

Symptoms

- High body temperature
- Low body temperature
- Change in breathing pattern
- Heart palpitations
- Cool extremities
- Pale mucous membranes
- Poor capillary refill time
- Rapid heart rate
- Low blood pressure
- Low to nil urine output (kidney failure)
- Restlessness
- Change in demeanour and behaviour e.g. Lethargy or neurological change
- Crying or calling out in distress, inability to be comforted
- Refusing feeds
- Bad breath (once organs or infection have become overwhelming)

A veterinarian may diagnose septic shock using:

- Clinical signs and a full clinical exam
- Culture of wounds, lung fluid or blood to detect infection
- Blood pressure monitors - Low blood pressure
- Xray – may reveal pneumonia or gastrointestinal issues
- Blood tests to revealing signs of infection, poor organ function or organ failure

Treatment

It is imperative that animals in septic shock are presented to a veterinarian immediately. Treatment for septic shock is outside the realms of wildlife rehabilitators.

Veterinary treatment includes:

- Oxygen therapy and relieving respiratory distress (if present)
- Administration of intravenous fluids to restore blood volume
- Appropriate antibiotics
- Monitor TPP (Total protein)
- Monitor PCV (Packed cell volume)
- Monitor electrolytes
- Treat underlying infections with surgery (if necessary)
- Support any poorly functioning organs
- Reverse abnormal blood clotting with appropriate medication
- Provide intensive care
- Constantly monitor the animal's vital signs
- Have wounds or blood cultured to identify the bacteria and adjust antibiotics if required

Septic shock has a high death rate. The cause of the infection, the wildlife rehabilitator's ability to recognise symptoms, how soon veterinary help is sought and the extent of damage to the organs will influence the animal's outcome.

Complications can arise including respiratory, cardiac and other organ failure.

Prevention

The prompt and appropriate treatment of bacterial infections is one of the best preventions; however not all cases of septic shock can be prevented. Small unfurred or just furred young will often die of septic shock without being diagnosed or treated. Learning to recognise the symptoms, taking immediate action including providing appropriate care and medication can help preserve more lives.

Respiratory Disease/Conditions

Definition

Respiratory disease refers to diseases of the animal's respiratory system. These include diseases of the lung, pleural cavity (the cavity that contains the lungs), the bronchial tubes (the large, delicate tubes that carry air into the tiny branches and smaller cells of the lungs), the trachea (an airway through which respiratory air passes in organisms) the upper respiratory tract; and the nerves and muscles used for breathing.

Respiratory disease can be life threatening and is a veterinary emergency.

Causes

Respiratory disease can range from mild and self-limiting conditions such as cold-like symptoms through to life-threatening conditions such as bacterial pneumonia, inhalation pneumonia or pulmonary embolism (a sudden blockage in a lung artery). It can also be a side effect of trauma to the lungs or chest cavity.

Smoking around animals is unacceptable and should be avoided; birds in particular are extremely sensitive to cigarette smoke.

Respiratory diseases are a common cause of illness and death in animals. They can go undiagnosed by inexperienced wildlife rehabilitators and can result in the sudden and unexpected death of an animal.

Electric shock can also cause respiratory disease. Possums and flying foxes that have contact with power lines may be affected. Care must be taken as the symptoms may not appear until several days after the electric shock has occurred. These animals should be monitored closely for several days by a veterinarian. The animals damaged lungs generally fill with fluid (oedema) within several days following the electrical shock. Animals with damaged lungs will have difficulty breathing and may die if left untreated.

Symptoms

Symptoms of respiratory disease differ depending on the cause of the disease but common symptoms are:

- Shortness of breath or difficulty inhaling a breath (dyspnea) which usually occurs with exertion and can interfere with normal behavior in a species. In severe cases, dyspnea occurs while resting
- Cough with or without the production of sputum (mucus or phlegm, mixed with saliva)
- Coughing blood from the lungs (haemoptysis)
- Chest pain - this may or may not be pleuritic (inflammation of the pleura: the pleura is a thin membrane with two layers), may worsen with the movements of breathing.
- Noisy breathing, either wheeze or stridor (noisy high-pitched breathing or wheezing/ whistling)
- Cyanosis, (a bluish discoloration of the lips, tongue or chin)
- Somnolence (drowsiness or sleeping too often and too long)
- Loss of appetite
- Weight loss

In some cases, respiratory disease in animals is diagnosed through a routine check where there are no apparent symptoms.

Recognition

Respiratory disease in animals is diagnosed by a veterinarian who will perform a number of tests which may include:

- Radiographs of the lungs/thoracic region
- Culture of microorganisms from secretions such as sputum
- Bronchoscopy (a thin tube that allows the vet to see down the airways)
- Biopsy of the lung or pleura (delicate tissue that lines the outside of the lungs)
- Ultrasound scanning can be useful to detect fluid such as pleural effusion

Treatment

Treatment of respiratory disease in animals depends on the particular disease being treated, the severity of disease and the species involved.

Where animals are being hand-raised or are in care for rehabilitation, factors such as regular exercise (if the animal is able to do so), reduction of stress, clean warm housing and nutrition are important in preventing and treating respiratory disease.

In addition, the following treatments are often used by the veterinarian for respiratory diseases:

- Inhalation medication (usually administered via a nebulizer)
- Corticosteroids
- Bronchodilators
- Antibiotics
- Physiotherapy
- Oxygen therapy
- Surgery

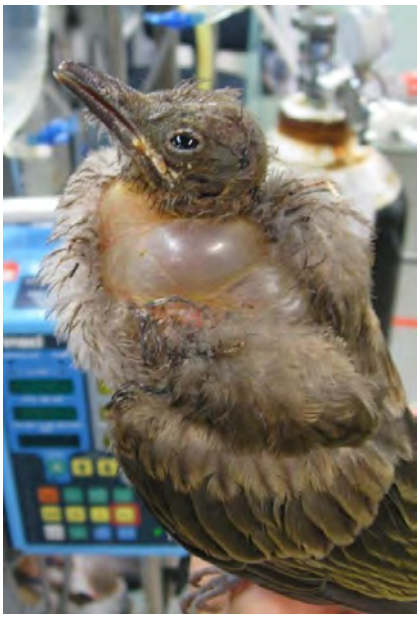


Photo Left: Figbird with ruptured air sac.
Photo Below: Blue-tongue Skink with a ruptured lung.

These types of injuries are veterinary emergencies.

Credit: Karen Scott and Annette Bird

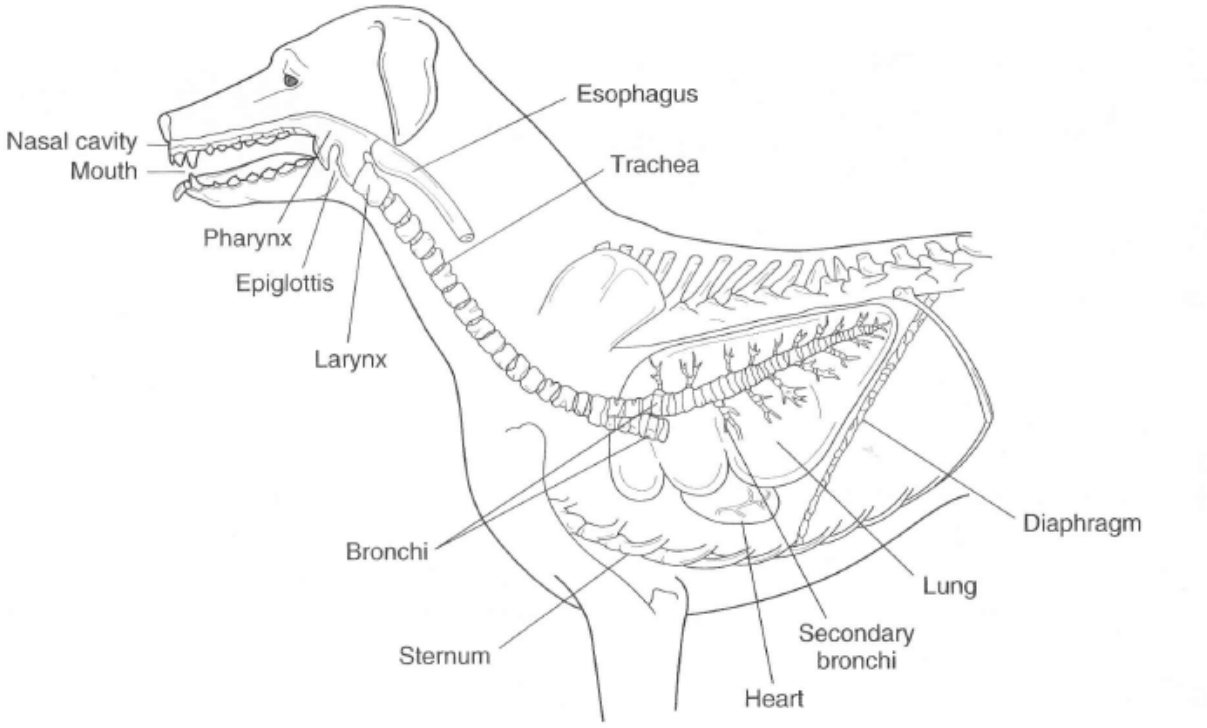


FIGURE 9–1 Structures of the respiratory system

Diagram: Respiratory system of mammals.
A diagram of the respiratory system of birds is included in the Bird Species Information Sheets.
Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)

Definition

Pneumonia is an illness that may result from a variety of causes, including infection with bacteria, viruses, parasites, fungi and foreign bodies such as leaf, milk or faecal inhalation being the most common causes. Pneumonia can occur in any animal with lungs, including mammals, birds, marsupials and reptiles.

Pneumonia is an illness that many wildlife rehabilitators will become familiar with. The environment of the lung is very moist, which makes it hospitable for bacteria. Many respiratory illnesses are the result of bacterial or viral infection of the lungs. Pneumonia can be a complicated issue that generally involves a lot of discussion between wildlife rehabilitators and their vets.

In general, we think of pneumonia as being caused by a bacteria or virus. Infant animals such as kangaroos, wallabies, echidnas and possums are predisposed to developing a bacterial or viral pneumonia during periods of stress such as weaning, environmental stressors such as the orphaning process, poor hygiene, inappropriate feeding and housing and inexperienced or multiple carers.

Pneumonia is a life-threatening illness but prompt treatment from your veterinarian may save your animals life.

Recognition

Wildlife species have distinct lung anatomy and physiology, different immune systems, diet and behaviour and are therefore affected by pneumonia differently. Symptoms associated with pneumonia can include:

- fever
- rapid or difficult breathing
- coughing or sneezing
- nasal discharge
- lethargy
- weight loss
- refusal of food or a reduction in food intake
- decreased activity

It is imperative if your animal displays any of the above symptoms that you seek veterinary help as soon as possible. Your veterinarian will use various diagnostic tools such as a thorough physical examination, radiography of the lung/chest and where possible, testing of the sputum.

Treatment

Animals that have a bacterial pneumonia that are diagnosed and treated early generally respond well to antibiotics and recover quickly. Those animals that are diagnosed with a viral pneumonia cannot be cured with antibiotics. Like humans, viral pneumonia must simply run its course although antibiotics are often still prescribed by the veterinarian to control potential bacterial complications.

Animals that are suffering with bacterial or viral pneumonia may exhibit similar symptoms such as fever, nasal discharge, poor appetite, lethargy and/or a cough. It is hard to know the true cause of the disease from outward appearances.

Your veterinarian will establish which type of pneumonia your animal is suffering from and prescribe appropriate antibiotics.

Your veterinarian may also prescribe antibiotics to be administered by nebulization (generally two to four times a day). This helps to clear the lungs and can aid in the treatment of some forms of pneumonia.

One of the most common causes of pneumonia in native animals is inhalation pneumonia which often caused by inappropriate feeding or feeding technique. To help prevent inhalation (aspiration) pneumonia, you should adopt the following good practice methods:

- never force an animal to eat or drink if it is unwilling
- use appropriate feeding equipment for the age and type of species – do not use feeding equipment that is designed for an older/larger animal
- always check latex joey teats before using to ensure that the hole is the correct size and has not split. Remember joeys feed from a very small hole in the mother's teat so the hole in artificial teats should be a size similar to that.
- never feed a cold animal
- never feed an animal that is not able to swallow properly (weak animals should be provided with fluids by other methods)
- never attempt to feed a young animal if you have not been trained to do so – they can be difficult to feed and can aspirate easily
- ensure that you are familiar with species-specific behaviour and traits such as how they generally like to sit/be held when feeding
- ensure that young animals are kept warm when feeding
- keep all bedding and enclosures clean and free from bacteria (from spilt milk and/or faeces)

Fractures are commonly seen as a result of road trauma and predation (dog and cat attack). Some fractures are obvious to the naked eye, however some may need to be radiographed by a veterinarian to confirm their presence.

In a large percentage of wildlife cases, if an adult wild animal is able to be captured it is usually suffering from a fractured limb that disables the animal enough so that it can be caught. Common fracture sites in wildlife include the limb bones, pelvis, spine and jaw.

Definition

A fracture is defined as a complete or incomplete break in the continuity of a bone.

Fracture descriptions

The different types of fractures commonly seen in wildlife include:

Simple Fracture – where the bone has been broken cleanly into two pieces

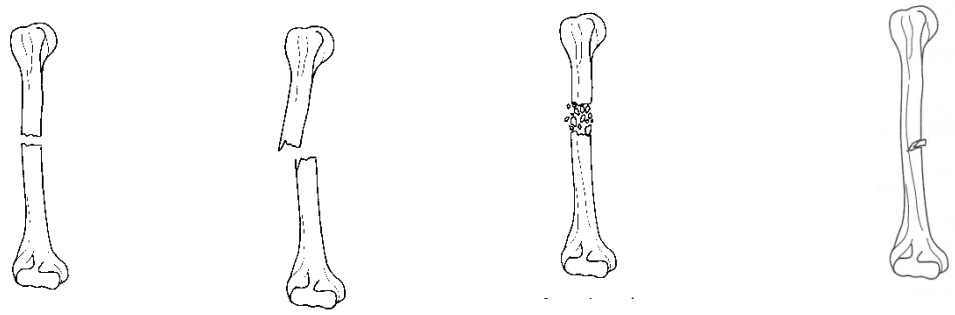
Multiple (or comminuted) Fracture – where the bone has been broken in a number of places

Compound (or open) Fracture – where the bone has been fractured and has punctured the skin

Complicated Fracture – includes damage to organs or other structures around the fracture site

Greenstick fracture – where the fracture does not pass through the bone

Pathological fracture – where a fracture occurs due to disease affecting/damaging the bone



Simple Fracture **Compound Fracture** **Multiple Fracture** **Greenstick Fracture**

Extracted from *An Illustrated Guide to Veterinary Medical Terminology* (Romich)

The **site** of the fracture on a particular bone is also a very important factor when determining the prognosis of the animal and is described using the following terms:

- **Proximal** – that part of the bone nearest to the body
- **Distal** – that part of the bone farthest from the body
- **Mid Shaft** – a fracture more or less in the centre of a long bone
- **Physeal** – a fracture through the growth plate of an immature animal (particularly common in macropods)
- **Diaphyseal** – a fracture of the diaphysis or mid shaft of the bone
- **Ephiphyseal** – a fracture of the epiphysis
- **Condylar** – a fracture of the epiphysis when condyles are involved

Recognition

Wildlife is often presented with some clinical signs of a fracture. Some fractures however cannot be confirmed without undertaking a radiograph. All wildlife that has suffered trauma should be radiographed to rule out fractures.

Obvious clinical signs of a fracture can include:

- **Swelling** – is often accompanied by bruising (understanding the anatomy of individual species is important to be able to identify what is normal and what is abnormal)
- **Immobility** - not using the limb, it may hang loosely (e.g. wing is dropped)
- **Lameness** – not being able to use the limb properly, although they will often still try to use the limb in an attempt to flee capture.
- **Open wound** – the broken end of a bone may be visible (any bleeding or wound around a suspected fracture could indicate a compound or open fracture)
- Grinding sensation on palpation (**crepitation**)
- **Bruising**
- **Pain** upon palpitation/assessment

Birds often succumb to fractures during trauma due to the lightweight nature of their skeletal structure. An accurate diagnosis and prompt treatment of fractures in birds is extremely important as fractures will start to set within 48 hours. Any delay in their diagnosis and treatment can cause irreparable damage.

Young, milk dependant marsupials often suffer from fractures when they and their mothers are hit by cars, particularly macropods. A thorough assessment of the joey is necessary to identify fractures, looking for any of the signs mentioned above. Fractures may not always be obvious and may only be during palpation and/or on radiographs. Unfurred joeys quite commonly present with no immediate sign of fractures, but within a few hours severe bruising can develops around the region of a fracture. Any bruising on unfurred joeys should be investigated by your vet. Fractures in and around the joints require a radiograph to determine if the growth plates have been affected.

In some cases, adult marsupials that suffer from fractures are not treated due the difficulties associated with keeping them immobilised during the healing process, and the related stress of being kept in captivity. Adult macropods in particular do not deal well with captivity and fractures in these animals will warrant euthanasia. The decision to treat a fracture however should be evaluated on an individual basis in conjunction with an experienced wildlife veterinarian.

Treatment

Urgent veterinary attention is required for all wildlife with fractures as they will be in significant pain. Prognosis is generally good for young animals with simple/closed fractures that are mid-shaft – provided that they are diagnosed and treated immediately. There is a poor prognosis for fractures that are near joints, fractures that have been open for more than 24 hours, compound or multiple fractures and those suffered by older animals.

Birds

If you suspect that the bird has a broken wing or leg, follow the following procedure:

- Place the bird in a cardboard box or carry cage
- Ensure that the box/cage is well lined with towels on the bottom and sides
- Place the bird in the middle of the box/carry cage with the towels on either side and in front of the bird to support the limbs
- Seek immediate veterinary assistance for the provision of pain relief and assistance with immobilising the limb pending a full veterinary assessment and radiographs

Strapping of the wing or leg can be undertaken, provided that you have been trained to do so. Immobilising the fracture can help to reduce pain and prevent further soft tissue damage.

Successful treatment of fractures in birds is dependent upon:

- Veterinary assessment and treatment. Many fractures require internal fixation (surgical placement of a fixture through the bone)
- Good physiotherapy during the bird's rehabilitation process
- Antibiotic and pain relief as prescribed by your vet
- Regular radiographs to ensure that the fracture is healing well
- The location of the fracture – fractures near joints, open/compound or multiple fractures or where multiple bones are affected have a poor prognosis

Mammals and Reptiles

If you suspect a mammal or reptile has sustained a fracture, undertake the following procedure:

- Keep the animal confined to a large pouch or pillowcase (if appropriate)
- Place the animal in a cardboard box or carry cage – ensure that the container is large enough for the animal's limbs to rest comfortably
- Ensure that the box or carry cage is well lined with towels on the bottom and sides
- Provide support to the appropriate limb to prevent further damage
- Seek assistance from your coordinator or veterinarian for assistance with immobilising the limb pending a full veterinary assessment and radiographs
- Seek assistance from your coordinator or veterinarian for advice on pain relief until you can take it for veterinary treatment

General notes for all species

Compound fractures that are potentially be treatable should be temporarily covered with sterile Solosite® gel or KY Jelly® then dressed with a sterile dressing (e.g. Melolin®) until a full veterinary assessment can be made.

It is not recommended that inexperienced wildlife rehabilitators stabilise fractures in animals or birds by splinting or strapping. Incorrectly stabilising a fractured limb or wing can cause considerable pain and distress to the animal. You should seek immediate veterinary assistance. Experienced wildlife rehabilitators acquire a level of experience to appropriately bandage and stabilise fractures temporarily and you should seek advice and assistance from if you are unable to transport the animal immediately to a veterinarian.

In all circumstances, it is necessary to seek veterinary assistance as soon as possible. For emergencies late at night, it may be necessary to seek assistance from an afterhours vet to have the animal stabilised until the fracture can be fully assessed by a wildlife veterinarian first thing in the morning. In this instance, it is appropriate (and desired) that the vet administer suitable pain relief (preferably an S8 analgesic).

Simple fractures can often be successfully treated, but prognosis may depend upon the limb affected and the age of the animal. In some cases, it may be necessary for the vet to surgically repair the fracture using an implant such as a pin or plate. This should only be done if the animal can be appropriately confined for the duration of healing (average 6-8weeks in mammals and 2-3 weeks in birds). Each case should be assessed in terms of what affect the fractured limb will have on its survival after release. It is imperative that their limbs are not compromised in any way.

Animals with compound and multiple fractures will often require euthanasia. Consideration also needs to be given to the cost involved in having fractures surgically pinned and any associated veterinary expenses including travelling/fuel expenses involved with regular visits to a wildlife hospital. The potential stress, pain and difficult rehabilitation that some animals may encounter throughout the healing process also needs to be considered.

The quality of the animal's life and the ability for it to live a normal life on release must be considered as a priority when making the decision to treat an animal with fractures. The decision must be made by a vet familiar with the treatment of native wildlife as some procedures which are suitable for domestic animals are unsuitable for native wildlife. This would include amputation of limbs or wings or the expectation that the animal will remain in care for the rest of its life.

Whiptail Wallaby joey

This joey sustained multiple fractures. The photo above shows a simple fracture of the right metatarsal and calcaneum. The photo on the right shows the same joey with multiple fractures of the left leg& hip evidenced by the way that the leg is hanging and the bruising to the inside of the hip area.

The joey was euthanised.

Credit: Karen Scott

Red Necked Pademelon
Jaw Fracture – notice the lack of symmetry to the jaw. Joey died from an unrelated condition.
Credit: Karen Scott

Unfurred Red Necked Wallaby
This simple midshaft fracture is clearly visible and the fracture can easily be palpated.
Joey was euthanised.
Credit: Karen Scott

Above - Eastern Grey Kangaroo
Compound fracture to hind leg. Euthanised.
Credit: Karen Scott

Above – Possum joey
Fractured toe evidenced by misalignment and bruising. Small fractures such as these are easy to overlook.
Credit: Kathryn Kielly

Above – Freshwater Turtle
Multiple fractures of the carpace. Euthanised.
Credit: AZWH

Above – Bearded Dragon
Multiple fractures of thejaw. Euthanised.
Credit: AZWH

Above – Australian Magpie
Simple fracture to leg. Euthanised.
Credit: AZWH

Above – Common Brushtail Possum
Multiple fractures to pelvis. Euthanised.
Credit: Karen Scott

Above – Common Brushtail Possum
This young joey sustained a fractured upper humerus.
Note on the photo on the right the way that the arm and shoulder are facing the wrong way.
Credit: Kathryn Kielly

Definition

Paralysis is the loss of voluntary movement or motor function due to a dysfunctional muscular system. Paresis is the loss of partial voluntary movement or motor function (e.g. one limb). Other terms used include: Paraparesis (e.g. two limbs) quadriparesis (e.g. four limbs). There are also other terms for the different parts of the body effected (e.g. facial paresis).

Cause

The most common cause of paralysis and paresis in wildlife is trauma related injuries such as vehicle trauma, domestic animal attack or a fall.

Recognition

It is important to understand the difference between 'nerve response or reflex' and 'pain response' when assessing an animal that has been subjected to trauma. A common mistake made by rehabilitators is confusing a pain response with an automated nervous system response. This confusion can occur when the limb of an animal with paralysis rapidly draws away from a stimulus such as a pinch or pull of the limb. This can be due to the automatic nature of the nervous system that results in a 'reflex' response and is not actually the animal consciously pulling the limb away because it is feeling pain. A pain response can be similar, but the animal tries to move away from the pinch or pull of the limb as well as trying to consciously draw the limb away. They may also vocalize or show other signs that the stimulus is painful.

Any wildlife that presents with partial or full loss of voluntary movement must be assessed by a veterinarian immediately. Severe cases are a veterinary emergency. In all cases, the early diagnosis and commencement of specialised treatment can mean the difference between life and death for the animal.

Refer to Section 2 Assessment Techniques (Nerve Response vs. Pain Response).

Treatment

An essential part assessing an animal with paralysis is to ensure full radiographs are undertaken to rule out irreparable fracture to the spine and assist with determining a prognosis.

Treatment will vary depending upon the limb(s) involved, the extent of the trauma and the species.

The prognosis also depends upon the length of time between the cause of the injury and the actual diagnosis and commencement of treatment. This is why it is imperative that these animals are assessed immediately by a veterinarian.

In animals that have no evidence of spinal lesions or breaks; nor any signs of other illness or disease, recovery is possible over a few weeks or months but you should see small signs of improvement after a few days.

Common Ringtail Possum suffering from partial paralysis. Note the hind feet are clenched.

Credit: AZWH

Wounds in wildlife are caused by a variety of circumstances including, domestic animal attacks, vehicle accidents, general trauma, infection, falls, fighting, burns, entanglement and human conflict.

Our ability to treat various wounds in wildlife depend on the seriousness of the injury, the location of the injury on the body, the time required in care for some species, and the animal's ability to cope with the treatment process and whether there are any other concurrent diseases or injuries present.

All wounds except those that are very minor should be cleaned and assessed by a veterinarian with the aid of a general anaesthetic.

Definition

Wounds can be defined as:

- **Abrasions**: are superficial scrapes or friction burns that may scab as they heal.
- **Contusions**: are bruises and swellings that have no external drainage.
- **Incisions**: are cuts which have clean edges and often heal with little scarring.
- **Lacerations**: are cuts with jagged tears and uneven edges.
- **Punctures**: are wounds that are deeper than they are wide.
- **Burns**: may be caused by friction, heat, cold (frostbite), chemicals and or electric shock.

A wound is a break in the skin (the outer layer of skin is called the epidermis). Wounds are usually caused by cuts, punctures, burns or scrapes. Different kinds of wounds may be treated differently from one another, depending upon the cause, how serious they are and the species involved.

The term **laceration** implies a torn or jagged wound. Lacerations go through all layers of the skin and into the fat or deeper tissues. Bleeding may be more brisk or severe. Severe blows by a blunt object, falls against a hard surface, fight wounds or contact with a sharp object are the most common causes of lacerations (e.g. road trauma, falling from a height, claws from another animal, whipper-snippers, or barb wire).

Cuts and lacerations both involve bleeding; some of the concerns with a cut or laceration include infection, pain, damage to structures beneath the animal's skin and the development of scar tissue which could inhibit natural movement of the affected area and fur or feather regrowth.

An **avulsion** refers to a wound where tissue is not just separated but torn away from the body (e.g. road trauma, domestic animal attack). It is not always associated with a break in the skin.

Scrapes and **abrasions** are superficial (on the surface). The deeper skin layers are intact, and bleeding is more of a slow ooze. They are usually caused by friction or rubbing against an abrasive surface (e.g. rocks, roads, branches, nesting burrows). They are common over joints and areas of bone. Abrasions can contain foreign material such as dirt, sand, bark, leaf litter etc.

Puncture wounds are generally caused by a pointed object entering the skin. Some of the most common examples are puncture wounds from teeth (e.g. in the case of domestic animal attack), debris or glass. Bleeding is usually minimal, and the wound may be barely noticeable.

Animal bites can cause puncture wounds, lacerations or a combination of both. These wounds are always contaminated by saliva and require extra care. Treatment of bite wounds, no matter how minor needs to be aggressive.

Wounds: The Healing Process

Healing is a response to the injury that sets into motion a sequence of events. With the exception of bone, all tissues heal with some scarring as they develop fibrous tissue. The objective of proper wound care is to minimize the possibility of infection and reducing scarring.

Keeping the animal's wound clean and well-tended too; ensuring all bedding and enclosures are kept in an immaculate condition, and that extra nutritional requirements are met will all aid in the animal's ability to heal. Reducing stress factors in the healing period will also aid the healing process.

There are basically 4 phases to the healing process:

1. **Inflammatory phase**: The inflammatory phase begins with the injury itself. This phase includes bleeding, immediate narrowing of the blood vessels, clot formation, and the release of various chemical substances into the wound that will begin the healing process. During this phase, immediate treatment of the initial wound is vitally important. A delay in the treatment of the wound will impact on the following phases in the healing process.

2. **Proliferative phase:** Next is the proliferative phase in which a matrix or latticework of cells forms. On this matrix, new skin cells and blood vessels will form. It is the new small blood vessels (known as capillaries) that give a healing wound its pink or purple-red appearance. These new blood vessels will supply the rebuilding cells with oxygen and nutrients to sustain the growth of the new cells and support the production of proteins (primarily collagen). The collagen acts as the framework upon which the new tissues build. Collagen is the dominant substance in the final scar.

3. **Remodelling phase**: This begins after 2-3 weeks. The framework (collagen) becomes more organized making the tissue stronger. The blood vessel density becomes less, and the wound begins to lose its pinkish colour. Over time, the area increases in strength, eventually reaching 70% of the strength of uninjured skin.

4. **Epithelialisation**: This is the process of laying down new skin, or epithelial, cells. The skin forms a protective barrier between the outer environment and the body. Its primary purpose is to protect against excessive water loss and bacteria colonisation. Reconstruction of this layer begins within a few hours and can be almost complete within 24-48 hours of an injury if it is clean and immediately sutured (stitched). Open wounds may take 7-10 days to epithelialize because the inflammatory process is prolonged, which contributes to scarring. Scarring occurs when the injury extends beyond the deep layer of the skin (into the dermis).

Treatment by a Wildlife Rehabilitator

Stop the Bleeding

The first step is to stop the bleeding. If direct pressure is not sufficient to do this, a bandage can help as a temporary measure for wounds on the arms, wings, body, head and legs. If you are unable to stop the bleeding, keep applying pressure to the wound and seek veterinary treatment immediately.

Assess the Wound

The second step is to assess the wound and establish what category it falls into (e.g. cut, laceration, burn, abrasion etc). Any wound other than minor scrapes and abrasions will require veterinary care and treatment.

Cleaning of the Wound

Cleaning is the most important aspect of good wound care; antibiotic administration does not substitute for the proper cleaning of wounds.

This may be done by first washing the adjacent skin with warm water or irrigation fluid (if available) and removing any crusted blood and debris. Wound cleansing is of paramount importance and cannot be overemphasised.

Wound irrigation should be copious. High pressure irrigation is more effective than low-pressure irrigation in reducing bacterial counts and wound infection rates. Normal saline is the most common choice of solution and should be used until the wound appears clean.

Irrigate the wound by squirting saline or clean water (e.g. drawing up into a 20ml syringe and attaching a catheter of 18g needle) onto/in the wound under high pressure. This is very effective at reducing bacterial contamination at the wound site.

Hydrogen peroxide and povidine (Betadine®) should NOT be used for irrigation.

Cover the Wound

Next apply a clean non-stick dressing (e.g. Melolin®) and wrap with a soft bandage. Take care not to apply the bandage too tight.

Seek Veterinary Assistance

Take the animal to a veterinarian as soon as possible. In severe cases, the animal should be taken to a veterinarian immediately and you should not worry with the preceding steps. The time taken to clean and irrigate the wound is better spent travelling to a vet who will be able to give the animal a general anaesthetic and undertake these steps with no pain and stress to the animal.

Treatment by a Veterinarian

A veterinarian is the best person to assess and treat the wound. Wounds on native wildlife are cared for in exactly the same way as a domestic animal, the only change to your veterinarian's general routine is that the animal will generally require sedation no matter the size or type of the wound. Sedation is used to reduce stress and pain.

Wounds should be cleaned, debrided, bandaged and treated whilst the animal is under sedation to reduce stress, pain and further injury in the animal, and facilitate cleaning by the veterinarian. Unlike domestic animals, a wild animal will not easily allow a veterinarian to treat its wounds without sedation. One that does is a very sick animal and most likely in a life-threatening situation.

Medication to numb the area (local anaesthetic) as well as a general anaesthesia may be used. Local anaesthetic targeting a specific area can make the animals recovery much smoother. Depending on the size, depth and location of the wound, this may be done using a topical preparation or direct injection of local anasthetic in and around the wound. Other forms of analgesia (pain relief) such as opioids may also be used to provide general analgesia (e.g. Methone®, Temgesic® or Fentanyl®)

Your veterinarian will decide the best way to repair the animal's wound.

- Some minor cuts can be closed with special adhesive tapes (Steri–Strips®) or tissue glue - this also depends on the species and wound location. Tissue glue can be used as a barrier against common bacterial microbes by sealing the wound. Tissue glue should not be placed directly in the wound or used in areas of high tension or repetitive movements, such as over joints. The application is rapid and relatively painless. Tissue glue will slough off in 5-10 days.
- Some small unfurred or just furred animals can have an allergic reaction to some adhesive tapes (Steri-Strips® or Micropore®). If reddening of the skin occurs a different closure method such as tissue glue or sutures may be required.
- Deeper cuts and wounds may need sutures or staples to repair deeper structures such as the fascia (the connective tissue envelope around a muscle).
- Sutures to the skin surface can help to stop bleeding, protect underlying tissues and lessen scarring.
- Different bandages are chosen for their different material properties.
- Some materials are better because they do not stick to the animals wound (e.g. Micropore®, Hydrogel® etc).
- Others are highly absorbent, assist with providing pressure to the wound's surface, or help to keep an injury immobile. Pressure bandages or splints may be used but application depends on the underlying injuries, the area affected and the species of the animal.

It is imperative that you carefully follow the Treatment Plan set out by your veterinarian when caring for an animal with wounds. If a re-visit to the veterinarian is required, make sure you attend on the allocated date.

Some wounds require appropriate care within a specific time frame. Infant animals will require more regular bandage changes as they grow. If bandaging becomes wet or soiled before the vet visit is due, contact your vet to find out if you need to bring the animal in sooner.

Sutured or stapled lacerations should be covered with a protective, non-adherent dressing for 24 to 48 hours or sprayed with Opsite®. If the wound is greater than 48hrs old exposed wound margins that do not have Opsite® or tissue glue applied should be gently washed with soap and water daily, if possible. If the washing process is too stressful for the animal, or you have to use significant restraint cease cleaning and leave the wound alone (or seek advice from your veterinarian).

If the wound appears to be significantly exudative (weepy with or without pus), seek veterinary advice.

Always be mindful and monitor for any signs of infection. These could include swelling, hotness on or around the wound, increasing attention being paid to the wound by the animal and exudate. Contact your veterinarian immediately if you suspect the wound has become infected.

Scrubbing or soaking the wound should be avoided. Topical antibiotic ointments applied to the wound may help reduce wound infection. Maintaining a moist wound margin with topical antibiotic ointments can also increase the rate of re-epithelisation. However, topical antibiotic ointments should not be used with tissue adhesives as the glue may slough and should only be used if directed by your vet.

Removal of Sutures

The timing of suture removal is variable and on examination of the wound your veterinarian will decide when sutures should be removed. The time from suturing the wound to suture removal, varies from 5-14 days, but it is imperative that you are guided by your veterinarian on when sutures should be removed as some wounds may take longer to heal than others. A veterinarian should assess the wound before any sutures are removed.

Before removing the sutures, the wound margins should be healing and appear closed. A ridge of healing tissue may be felt and the tissue join should not separate when gentle pressure is applied.

Pain relief

The degree of pain elicited by an injury can vary and is not always dependant on the the size of the wound, but also the depth of the injury and what inflicted it. In general, significant events such as 'hit by car', 'dog attack' and burns should be presumed to inflict significant pain and its recommended that animals rescued for these reasons should receive at least one opioid administration as their initial analgesia. You may need to take the animal to an emergency centre or a 24hr wildlife hospital. All animals rescued for these reasons should be further assessed by a wildlife veterinarian within 12-24hrs of the event.

An animal that has been hit by a car, even with relatively minor injuries will require opioids (S8 analgesics) for a period of time as tissue damage such as bruising can be intensely painful.

Major burns and trauma that cover a large degree of the animal's body will require the use of opioids such as Methone®, Temgesic® or Pain Stop Daytime® (see pain relief in burns). A Fentanyl infusion may also be beneficial.

Minor wounds will still require some pain relief in the first few days. Pain relief can be in the form of Metacam®, Rimadyl® or Infant Panadol®.

The best way to assess pain is to think about how you would feel with a similar injury and ask the veterinarian to medicate accordingly.

Antibiotics

Heavily contaminated wounds or those inflicted by domestic animals (e.g. cat and dogs) are likely to require antibiotic therapy. Antibiotics differ in their effectiveness and it is essential that the choice of antibiotic is advised on by a veterinarian.

Antibiotics only work if given at the appropriate time. Refer to Section 5 Veterinary Aspects of Wildlife Rehabilitation and ensure that you follow closely the requirements for providing medications.

Wound care

Wound care varies according to the type of the wound. The best results are obtained when the animal is in good health. The veterinarian will advise you on the best way to care for the wound whilst it is healing. The veterinarian should provide you with a Treatment Plan for the animal including details of the medications provided, when re-checks are required and what care needs to be undertaken with respect to the wound.

When caring for wildlife at home, it is imperative that you keep flies off all wounds. Animals with open wounds should be housed indoors or in an enclosure that is fly proof.

Left

Basic items used for treating abrasions including:-

Saline for Irrigation (bottle, bag or small vials)
Betadine®
Chlorhexidine Solution®
Sterile syringes
Plastic dish
Cotton balls
Gauze swabs
Tweezers

Credit: Karen Scott

Left - Red Necked Wallaby

Abrasions to both feet.

Superficial wounds such as these can be cleaned and antiseptic applied by wildlife rehabilitators.

Credit: Karen Scott

Left – Common Brushtail Possum

Abrasions to hind leg.

Superficial wounds such as these can be cleaned and antiseptic applied by wildlife rehabilitators.

Credit: Karen Scott

Above: Swamp Wallaby joey with lacerations to the base of his left ear and the hock joint. Cases such as these require veterinary attention.

Credit: Karen Scott

Above – Red Necked Pademelon
Joey sustained a deep laceration which nearly severed his scrotum. This type of injury would require immediate veterinary attention.
Joey was euthanised as he had multiple injuries.

Credit: Karen Scott

Above – Red Necked Wallaby
Open wound sustained to left hind leg when hit by car. The fur around the wound has been clipped, the wound debrided by a veterinarian and Duo-Derm® ointment applied and the wallaby housed indoors.

Credit: Karen Scott

Above – Red Necked Wallaby
Open wound with multiple fractures to the front paw. Animal was euthanised.

Credit: AZWH

Above – Common Brushtail Possum
Open wound along the entire length of hind leg. Wound was treated with Medihoney® and was successfully healed.

Credit: AZWH

Left– Mountain Brushtail Possum

Wound on the possums head has been cleaned and drains inserted (the small white pieces).

Credit: AZWH

Left– Common Brushtail Possum
Wound caused by exudative dermatitis. This is a chronic condition.

Credit: AZWH

Left – Carpet Python

Extensive abrasions resulting in significant loss of skin.

More advanced cases such as these require veterinary treatment for wound cleaning and debridement. Anaesthetic and pain relief would be recommended.

Credit: AZWH

Left – Koala

Extensive abrasions and open wounds such as this require immediate veterinary treatment.

Credit: AZWH

Head trauma is one of the most common injuries seen in wildlife. Common causes include being hit by a car, blunt trauma from hitting a structure (such as a window/building) or falling from a height (such as from a tree).

Head trauma can result in injury to the brain as well as the skeletal structure of the skull and neck.

Signs

Common signs of head trauma include:

- Abrasions/lacerations around the head/face
- Bleeding from the mouth, nose, ears or eyes
- Abnormal pupil size and symmetry
- Nystagmus (flicking of the eyes back and forth)
- Seizures
- Neurological signs such as an altered sense of mentation or circling

Head trauma, where any of the above symptoms are seen, is a veterinary emergency.

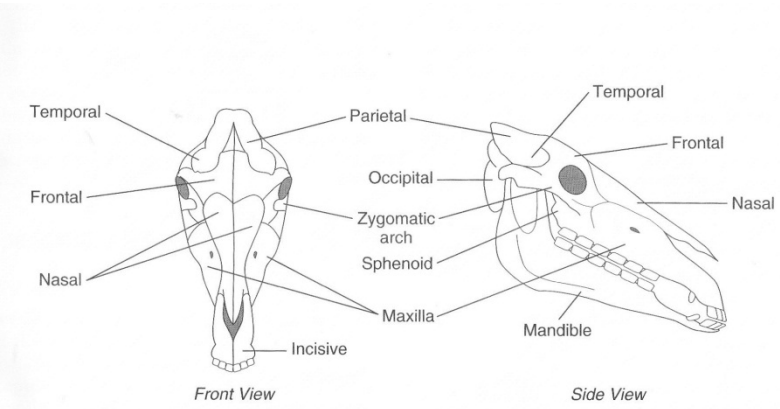
The veterinarian will conduct a thorough neurological examination to try and determine any brain injury and the suspected location of the lesion. Radiographs will also be taken to assess the head and neck for fractures. The veterinarian will then continue to monitor the animal at regular intervals to establish whether the clinical signs are improving or worsening.

Treatment

Your veterinarian will determine the most appropriate treatment which may include:

- Supportive care including oxygen therapy, fluid therapy, treatment of wounds and stabilisation of fractures
- Anti-inflammatories and sother medications specifically designed to reduce intracranial pressure

Wildlife that has suffered from a head trauma/injury should remain in veterinary care until they are stabilised, and any clinical signs of head trauma have resolved. Animals with severe head trauma should not be placed in home-care rehabilitation until recovered as these animals can deteriorate rapidly.



Bones of the skull and face.

Source: An Illustrated Guide to Veterinary Medical Terminology

Concussion

Concussion is a mild brain injury that results from an impact to the head, a violent jar or shock to the body. It is commonly seen in birds that have flown into a window or building.

Signs

Wildlife often present with a history of hitting a solid object (for example the caller heard a thud and found the animal near a window).

Common signs of concussion include:

- Loss of consciousness
- Irregular breathing (may be rapid or slow)
- Injury (such as bleeding from the nose/nares, abrasions or bruising)
- Neurological signs (such as circling, dullness, change in pupils)
- Sensitivity to light and loud noises
- Lack of mobility (may stumble or have trouble standing/walking)
- Paralysis

Treatment

Immediate treatment includes placing the animal in a comfortable rescue/transport carrier and leaving it in a dark and quiet environment.

In cases where the animal has no obvious sign of injury and no adverse neurological signs, leave the animal in a quiet, dark environment for 2 to 4 hours to allow it to recover. After this time, re-assess the animals condition. If it has improved keep for 24 hours to allow it completely recover and then re-assess for release.

In cases where there is an obvious injury (such as bleeding, bruising, fractures, paralysis etc), the animal should receive immediate veterinary attention including radiographs, pain relief, anti-inflammatories and antibiotics where appropriate.

Eye injuries are relatively common in all species of wildlife that have sustained trauma to the head, the most common of which include vehicle strike and domestic animal attack. Eye conditions can also be seen that have not resulted from a recent event, or that may not be related to trauma. Any injury to the eye can impact the animal's vision, but not all eye conditions are permanent.

Recognition

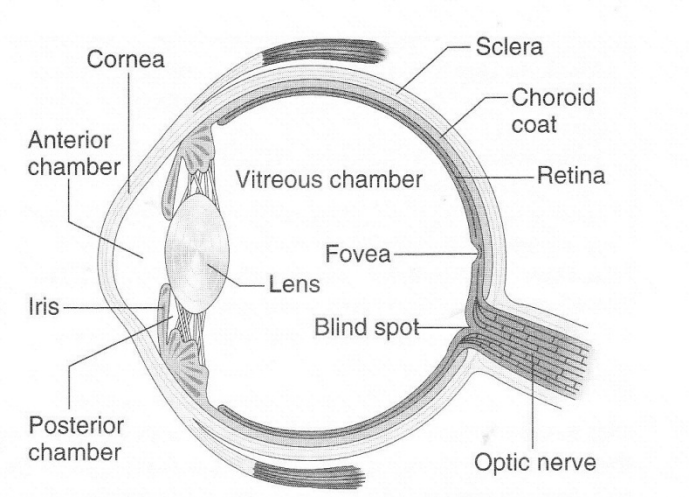
A thorough examination of the eyes should be conducted all animals coming into care, regardless of the reason. The external ocular features such as the eyelids, sclera, cornea and third eyelid can be examined relatively easily. The internal structures of the eye, such as the lens, iris and internal chambers of the eyeball are more difficult to assess thoroughly and may require specialised equipment. Your veterinarian is best placed to assess any eye injury.

Common clinical signs of eye injuries/conditions include:

- Discharge in, around or under the eye – tears, blood, pus, water-like fluid
- Changes in the sclera (should be white) – may be red (inflammation or blood) or yellow (jaundice)
- Third eyelid in abnormal position – may be bulging or protruding across the eye
- Changes to the surface of the cornea – may be cloudy, have small blood vessels present or an irregular surface

Any injuries or abnormalities of the eye should receive immediate veterinary attention in an attempt to preserve the function of the eye. Remember, many wildlife species rely on 100% vision for their ability to survive.

Other abnormalities (non-injury related) should be assessed by a veterinarian within 24 hours to determine the cause as this may impact on the animal's suitability for rehabilitation.



Chambers of the Eye

Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)

Injuries

Injuries to the eye area can be extremely painful and are veterinary emergencies. Take care not to touch the eye to prevent unnecessary pain and further damage.

Common injuries include:

Corneal injuries, caused by:

- Penetrating wounds – may be a result of being hit by car, attacked by domestic animals, fighting with other individuals (normal behaviour), interaction with other native animal during defence or hitting a window/building etc. can result in infection within the eyes or cornea, the loss of essential fluid from within the eye or the total collapse of the eyeball. Cornea may look shrunken/wrinkled.
- Non-penetrating wounds – most commonly being corneal ulcers. Usually result from damage to the cornea by substances such as gravel, sand, dirt, branches etc.
- Exposure – due to drying of the corneal surface either by non-functional eyelids or exposure to extreme or prolonged heat or cold (common in orphaned joeys that have been exposed to the elements during cold weather)

Prolapse of the eyeball - where the eye becomes dislodged from the socket and is exteriorised. Most often seen in wildlife that have been hit by a vehicle or attacked by domestic animals. Often associated with fractures to the skull.

Direct trauma to the eyeball – causes haemorrhage within the eye – the internal structures of the eye may appear bloodied

Injuries to the eyelid - can cause severe pain and generally the animal will keep the eye shut. Often caused by trauma where the eyelid is lacerated or abraded.

Treatment of Ocular Injuries

Eye injuries can be classified as requiring 'immediate treatment' which can be undertaken by a wildlife rehabilitator and 'veterinary treatment' which must be undertaken by your veterinarian.

Eye injuries which result in a prolapse of the eyeball or penetrating wound must receive immediate veterinary attention. These are veterinary emergencies.

'Immediate Treatment' (by wildlife rehabilitator)

For less severe injuries such as non-penetrating wounds, the following treatment may be initiated:

- Flush the eye with sterile saline to clean the area (if debris is present)
- Keep the eye moist by using lubricating eye drops (such as Refresh® or Eye Stream®) or sterile saline – this needs to be administered every 2 hours
- Place the animal in a darkened area
- Keep the animal warm and treat for shock (if appropriate)

Veterinary Treatment

Your veterinarian will undertake a thorough assessment of the eye including:

- Assessing the pupil's response to light
- Assessment of all external and internal ocular features
- Assessment of internal ocular features with the use of an ophthalmoscope
- Radiographs of the skull to rule out fractures around the eye

Treatment will be dependent upon the injury sustained and the severity.

Corneal ulcers are commonly treated with topical antibiotics (either ointment or drops) and pain relief.

Conditions

Abnormal conditions of the eye are found in many species. Knowledge of conditions found in the species that you are assessing is essential.

The most eye common conditions found in wildlife include:

- Conjunctivitis – an inflammatory reaction caused by reddening and inflammation of the sclera and conjunctiva (commonly seen in koalas as a form of Chlamydia)
- Cataracts – seen in various species – can be congenital or result from unrectified dehydration or poor diet (quite common in hand-reared/orphaned marsupials)
- Opaque eyes – seen in snakes and geckoes when they are shedding (this is normal)

Cataracts

Cataracts are white spots in the lens of the eye that may impair vision and cause blindness. Cataracts may result from:

- Trauma – caused by damage to internal structures of the eye
- Inadequate diet – may develop during hand-rearing/rehabilitation when not provided with adequate nutrition. May also be associated with feeding lactose containing milk formulas.
- Dehydration – may result where an animal has been severely dehydrated and inadequate fluid therapy was provided
- Congenital – present at birth (occasionally seen in wildlife)
- Toxins – may develop if the eye is exposed to chemicals/toxins that damage the eye
- Old age – may be found in ageing animals with no other underlying cause

Not all cataracts will affect the entire lens and, in many cases, only part of the lens is involved. In some cases, cataracts do not progress further, however if the cataract does continue to progress vision may be fully impeded (i.e. blindness).

Any animal that is affected by cataracts should receive a full assessment by a competent wildlife veterinarian to determine the animal's suitability for release.

Conjunctivitis

Conjunctivitis is inflammation of the mucous membranes of the eye (conjunctiva) and may be caused by:

- viral or bacterial infection (such as Chlamydia in koalas)
- parasites such as an overburden of ticks around the eye
- Secondary to trauma of the eye

Glaucoma

Glaucoma is an elevation of pressure inside the eyeball and can lead to irreversible blindness. Signs of glaucoma include enlarged pupils, cloudy lenses and redness.

Treatment of Ocular Conditions

Treatment of eye conditions will vary depending on the condition present.

Again, the veterinarian is responsible for performing a thorough assessment of the external and interior ocular features (as outlined above).

Most external eye diseases are treated with antibacterial eye drops or ointment that must be applied several times a day and eliminating the cause of the inflammation. **Early detection and commencement of treatment is essential to prevent permanent loss of vision.**

Treatment of acute glaucoma should be started as soon as possible in order to reduce the pressure before permanent damage occurs. This is a veterinary emergency.

Opthalmoscope

This is an instrument used for examining the surface and interior structures of the eye. It emits a bright, focused narrow beam of light that can penetrate through the lens. The opthalmoscope has a perforated mirror and a variety of inbuilt lenses that can be selected to assist veterinarians with examining the interior parts of the eye. Can help detect possible disorders of the eyes.

Wallaby Joey and Brushtail Possum both with opaque colouration to cornea suggesting trauma to the corneal surface.

Credit: Karen Scott (wallaby) and AZWH (possum)

Koala with unilateral conjunctivitis

Note the inflammation around the eye which prevents the koala from seeing from that eye.

Credit: AZWH

Boobook Owl with trauma to left eye.

Eye injuries to species that rely on perfect vision (such as birds of prey) often result in them being unreleasable and euthanasia is often the only option.

Credit: AZWH

For more examples of eye injuries and conditions refer to the Section Assessment – Eyes.

Domestic Animal Attack

Domestic animal attacks are one of the most common causes of injury to wildlife. The resultant injuries can range from small puncture wounds to deep lacerations, evisceration, fractures and internal bleeding.

It is important to be aware that puncture wounds from a domestic animal (particularly cats) often close over very quickly and there may be very little sign of any wounds soon after the attack. In many cases, the teeth may not actually puncture the skin but can still cause substantial damage internally to muscles and organs.

Recognising dog and cat attack injuries

In unfurred joeys, thoroughly check the joey for bruising or bright pink colouration in the skin.

For furred joeys, adult mammals and birds, finding signs of puncture wounds is a little more difficult. Part the feathers or fur over the entire body to check the skin, again looking for small punctures and bruising under the skin. Take note of any wet areas of fur or feathers. During a dog attack, dog saliva may coat and dry on the animal's fur or feathers. This may look like a spider's web, feathers may appear matted, or the tips of fur may look a bit like a paintbrush.

Dog attack victims will sometimes have no external injuries, however most will sustain serious and life-threatening internal trauma. Any animal that has saliva present on their coat or skin or are suspected to have been attacked by a dog need to be checked immediately by a veterinarian.

Sometimes animals that are picked up by dogs or cats suffer puncture wounds around the chest which may develop into a condition whereby air escapes from punctured lungs and is trapped in subcutaneous layers between the skin and muscle/rib cage (subcutaneous emphysema) – these cases may be fatal.

Obtaining an accurate history of the animal is also important. An animal that was seen 'in the mouth' of a domestic animal should be treated as a likely domestic animal attack, regardless of whether puncture wounds are found on an initial examination or not.

Treatment

If you suspect that an animal has been the subject of a domestic animal attack, it is imperative that you seek veterinary treatment immediately as the animal is likely to require a course of antibiotics (prescribed by the veterinarian) or in severe cases, euthanasia.

It is imperative that antibiotic treatment is commenced as soon as possible. The delay in commencing treatment, even by as little as 12 hours, can significantly reduce the chances of survival.

Wounds need to be treated by a veterinarian who will thoroughly flush the puncture wounds to reduce bacterial colonisation and manually remove debris or contaminants from the wound. (Refer to Section on Wounds).

In all cases, supportive therapy will be required – including warmth, fluids and a quiet, stress free environment. Pain relief is recommended in severe cases.

Above
Both birds have been attacked by cats. The finch on the right has obvious open wounds caused by the bite. The bird on the left has missing and dishevelled feathers indicating possible puncture wounds.
Credit: AZWH

Above – Common Ringtail Possums
Both joeys were attacked by cats. On the left – note the small red "pin pricks" – these are small puncture wounds. On the right – the puncture wounds are more obvious.
Credit: Kathryn Kielly

Above – Red Necked Wallaby
Extensive puncture wounds on the tail of the joey. It was suspected that these were caused by a cat.
Credit: Karen Scott

Above – Common Brushtail Possum
Large puncture wounds on the rump and belly caused by a dog. The bite penetrated the possum's pouch and caused severe damage to the possum joey.
Credit: Karen Scott

Above – Common Ringtail Possum
Extensive puncture wounds, bruising and fur loss caused by a dog attack.
Credit: AZWH

Above – Common Brushtail Possum
Joey sustained a deep puncture wound to the left hip area as a result of a dog attack.
Credit: AZWH

Bruising is very common in all species of wildlife affected by trauma. Bruising occurs where blood vessels and capillaries have been ruptured and bleeding develops in the soft tissue beneath. Bruising may not appear for up to 48 hours after the incident, so it is important to re-assess trauma victims regularly during this time.

Recognition

Bruises begin as red areas, become purple and in 3-4 days turn green in colour. They are often associated with swelling of the area.

Treatment

Any bruising on the head should be investigated by your vet to rule out any neurological involvement. Sometimes, in the cases of head trauma, it may be necessary for your vet to administer a cortisone injection to reduce any swelling in the brain. This needs to be administered as soon as possible to give the animal the best chance of survival.

Bruising of the head of a young joey may indicate that the joey has been forcefully ejected from the pouch, likely at the time the mother was hit by a car, or by being pulled roughly from the teat. Joeys with this sort of injury often die within a few days.

Any bruising around the abdomen should be investigated by your vet to rule out internal damage and/or bleeding. Deep bruising on other parts of the body may also indicate fractures and should be investigated by your vet.

Animals with severe bruising will require pain relief which may be prescribed by your vet. Antibiotics may also be prescribed in moderate to severe cases.

There are several homeopathic remedies available which some rehabilitators have had some success with. These include Arnica cream or Traumeel®. Traumeel® has been successfully used on membranes of bats suffering from extensive bruising. Traumeel® also comes in an oral form. Preparation H® is another topical ointment which aids in reducing bruising to membranes.

Unfurred Red Necked Pademelon

Extensive bruising to the head. This type of bruising is usually caused by the impact of the mother being hit by a car and the joey being pulled from the teat.

Credit: Karen Scott

Above – Common Brushtail Possum
Joey suffering from bruising to the head and hind leg. Joey recovered.
Credit: Kathryn Kielly

Above – Koala
Young joey with extensive bruising to hind leg which was caused by an infection. Joey died.
Credit: AZWH

Left– Common Brushtail Possum

Joey suffered extensive injuries from a dog attack. The joey was in his mother's pouch – the dogs teeth penetrated the pouch and caused extensive bruising and a fractured hip.

Credit: Karen Scott

Above- Pacific Baza
The photo on the left shows the bird before preparation for surgery.
The photo on the right with the feathers removed clearly shows the extensive bruising to the pectoral muscle and keel bone.
Credit: AZWH

Bleeding or haemorrhage can occur as a result of traumatic events such as road trauma, domestic animal attack or a fall.

Injuries such as open fractures, abrasions, lacerations and evisceration can create haemorrhage. Internal bleeding is generally caused by trauma-related injuries from road trauma and domestic animal attacks. Bleeding can also be caused by poisoning (e.g. rodenticide baits).

Recognition

External bleeding – evidence of external bleeding should be quite obvious. There is usually blood on the skin, fur or feathers.

Internal bleeding – is often difficult to detect and should be diagnosed by a vet. Signs of internal bleeding may include pale mucous membranes (that do not respond to treatment for shock) and poor capillary refill time. Obtaining an accurate history of the animal's situation can assist with determining if it could be suffering from internal bleeding (for example, a possum hit by a car may have suffered some form of internal bleeding). Depending upon the extent of the internal injuries, some animals suffering from internal bleeding may die in a short period of time, whilst others with less severe injuries could suffer from a slow internal bleed over a period of days or even weeks.

If you suspect that the animal may be suffering from internal bleeding, get it to a veterinarian as soon as possible. Do not offer anything orally (food or water) until advised by your vet.

Treatment

External Bleeding -

Control bleeding by using sterile cotton gauze swabs and applying gentle pressure or a support bandage to the site. This will absorb the blood and allow clotting to commence. Do not disturb blood clots after they have formed. Most small wounds will usually stop bleeding quickly.

Keep the animal warm, restrict movement and treat for shock. If blood soaks through, do not remove the dressing, simply add additional layers and continue applying direct pressure. Veterinary attention must be sought urgently if bleeding is excessive and cannot be controlled.

Internal Bleeding -

Any animal suspected of suffering from internal bleeding needs to be assessed by a vet immediately. This is a veterinary emergency.

Internal bleeding that is not treated can lead to advanced shock and death of the animal.

Entanglement is common amongst many species of wildlife.

The most common causes and the species most at risk are:

- Barbed Wire – predominantly bats, birds, gliders
- Incorrectly fitted or discarded fruit netting – bats, birds, gliders, reptiles
- Discarded fishing line and hooks, crab pots – sea and water birds, turtles
- Active fishing – sea and water birds
- Discarded rubbish – sea and water birds, sea and freshwater turtles

Recognition

Often wildlife that have become entangled present still entangled in the material, so it is easy recognise the cause of the entanglement.

Damage caused by entanglement include:

- Tears to membranes (bats and gliders)
- Lacerations
- Tissue damage
- Bruising
- Mouth damage (from the animal trying to free itself)
- Loss of limbs/ flippers/ wings due to constriction/entanglement in lines & ropes

Treatment

For severely entangled animals and birds it is preferable that the animal is anaesthetised prior to removing the material. This prevents undue stress and pain and can significantly reduce the risk of further damage to the limb or membrane. Refer to Section 1 Wildlife Rescue (Entanglement).

The injuries caused by entanglement are highly variable and each case needs to be assessed on an individual basis. Unfortunately, in a number of cases the animals suffer from secondary injuries (such as fractured jaws or extensive mouth injuries) as they try to free themselves.

Left: Black Flying Fox caught in fruit netting.

Credit: Mark Alexander

Top - Eastern Grey Kangaroo
Kangaroo was caught by its hind foot in a wire fence. The wire was deeply embedded into the foot. The animal was sedated so that it could be safely removed from the wire. The prognosis for large animals found hanging from their legs for an extended period of time is very poor.
Credit: Mark Alexander

Above – Water Bird
Entangled in fishing line with a fishing hook embedding into the foot.
Credit: AZWH

Above –Bird
Bird was caught on a barbed wire fence.
Credit: AZWH

Above – Sugar Glider
Entangled on a barbed wire fence. The glider was anaesthetised while the wire was carefully removed. This helped reduce the damage to the membrane as shown in the photo on the right.
Credit: AZWH

Burn injuries in wildlife may be acquired through a variety of sources including bushfire, lit chimneys, barbeque hotplates, contact with electrical wires and chemical burns from contact with caustic agents.

Recognition

BURNS - Clinical signs vary but may include:

- singed or charred feathers or fur
- alopecia
- hot swollen area of skin
- inflamed moist/exudative or blistered skin
- sooty/blackened looking skin
- necrosis of tissue

SMOKE INHALATION - Clinical signs are generally evidenced by:

- burns to the opening of the nasal passages
- blacked/discoloured nasal passages
- nasal discharge
- irregular breathing pattern/ and/or
- difficulty in breathing

ELECTROCUTION – Clinical signs may include:

- Collapse
- Stiffness and twitching/convulsions
- Necrotic or burnt extremities (i.e. ears, toes, paw/foot)
- Spastic muscle contractions
- Hair and ears standing on end
- Sharp, short breaths

Burns, smoke inhalation and electrocution are usually accompanied by dehydration and shock. It is important that these conditions are treated in conjunction with the injuries sustained from the trauma.

With all types of burns, there is a high risk of secondary infection and strict attention to hygiene is essential to ensure wounds do not become infected.

Burns are generally classified as follows:

First Degree (or Superficial)

- Usually only involves the epidermis (outermost skin layer)
- Affected areas are painful for 2-3 days
- Affected area may be reddened or inflamed for <48hrs
- Hair may be singed but still firmly attached.
- Healing is generally fairly rapid.

Second Degree (or Partial Thickness)

- Usually involves greater damage to the skin than superficial burns and affects all layers of the dermis
- Usually forms blisters – may not develop until several hours after the injury
- Affected areas are painful
- Healing is fairly slow

Third Degree (or Full Thickness)

- Entire skin is destroyed – affects all layers of the dermis
- Affected areas are painless
- Hair falls out
- Skin may appear white or black and leathery, firm and depressed compared with surrounding skin.
- Healing is very slow

Treatment

Animals with burns require immediate veterinary attention, as they require prompt assessment of the extent of the damage to not only the affected areas of skin but to other organs as well.

Euthanasia should be seriously considered in animals if:

- The animal is old
- The animal is very young (e.g. small joeys)
- They are suffering from partial or full thickness burns
- The affected area covers the head or is over joints
- If more than 50% of the animal's body is affected by burns
- If more than one limb is severely affected and is likely to compromise mobility
- If you are unable to access **immediate** veterinary assistance
- If you are unable to access **ongoing** veterinary support
- If you are unable to control the animal's pain with prescribed medications

Initial Treatment for Burns by Wildlife Carers

The prognosis for an animal that has sustained burns will be improved if you undertake the following steps:

1 – Initial Assessment

Conduct an immediate initial assessment of the animal. Check the animal's mucous membrane colour and capillary refill time (if possible). Take note of the animal's respiration. Assess whether the animal is dehydrated.

2- Cool the Affected Areas

If the animal has suffered burns within 2 hours from rescue, the affected areas should be cooled with water or saline. This helps prevent further damage to the tissue. You can do this by soaking cotton swabs in a water/saline solution and placing them gently on the affected areas. Continue cooling the areas for >20 minutes.

3- Monitor the Animal's Temperature

You will need to closely monitor the animal's temperature to ensure that it does not become hypothermic.

4 - Seek Immediate Veterinary Help

It is imperative that you seek immediate veterinary assistance. If you cannot access a vet immediately, please contact your nearest Wildcare Trauma Carer.

Treatment of Burns by your Vet

To minimise pain and reduce stress, animals should be anaesthetised or sedated by your vet whilst assessing and treating burns.

Your vet will complete a thorough assessment of the animal and look for any secondary conditions such as internal damage and smoke inhalation that may affect its prognosis.

Animals with severe burns will require:

- Intravenous fluids
- Oxygen therapy (particularly for smoke inhalation)
- Antibiotics
- ANALGESICS (pain relief) – **this is extremely important. For severe burns, the use of opioids (S8 drugs) will be warranted. Analgesia may be required for many days.**

If the decision is made to treat the animal, then your vet will clean the affected areas, debride them where needed and apply an appropriate dressing and bandage.

Your vet should provide you with a Treatment Plan for the animal that may include:

- Antibiotics
- Appropriate pain relief medication
- Details of any bandage changes – when required, what dressings to use etc.

Ensure that you follow your Vet's directions closely.

Caring for burn victims is a big commitment as they involve intensive wound management and ongoing fluid therapy. They also require additional nutritional support to aid in healing – often up to 200% to 300% of their usual daily nutritional intake. They may require force feeding or at the very least, regular hand feeding. Animals suffering from smoke inhalation may require regular treatment with a nebuliser.

Do not take on the care of a burns victim if you do not have the time to devote to them. Burn victims should ideally be cared for in a 24-hour wildlife hospital/facility.

Above – Common Ringtail Possum
Possum was electrocuted on power lines. Note the hand is extremely blistered.
Credit: AZWH

Above – Flying Fox
Wing membrane damage caused by electrocution on power lines. Note the charred section of membrane on the left photo and the haemorrhaging in the membrane on the right photo.
Credit: AZWH

Above: Koala with burns to the face and paws. Note the depigmentation of the pads due to burns (they should be black). Cases such as this require immediate veterinary attention. They are not suitable for home-care by wildlife rehabilitators.

Credit: AZWH

Definition

Poisoning occurs when a toxic substance is swallowed, inhaled or absorbed. Poisoning is also referred to as toxicoses or intoxication.

Poisoning may occur after a single exposure (with most clinical symptoms becoming evident within 24 hours) or after repeated or prolonged exposure to a toxin. The severity of the poisoning will depend upon the quantity the animal was exposed to, the size of the animal and the type of poison. Small doses of less-lethal toxins may have no harmful effects.

Toxins can be absorbed through a number of routes including:

- Skin
- Eyes
- Mucous membrane (mouth, nose, eyes)
- Lungs
- Digestive tract
- Mammary glands
- Uterus
- Direct injection

Symptoms

Symptoms may vary depending on the poison involved, but may include:

- Vomiting
- Respiratory distress
- Frothing from the mouth or nose
- Excessive salivation
- Seizures
- Diarrhoea
- Lack of coordination
- Weakness
- Pale mucous membranes
- Bleeding from orifices (such as ears, eyes, cloaca/vent)
- Excessive bruising without a history of trauma
- Death

Some toxins may produce a localised effect while others may enter the bloodstream and spread through the body. Some toxins can be passed by mammals to their young through milk production.

Poisoning in wildlife can occur as either mass poisonings or affect individuals. For Example:

Mass poisoning of birds through the ingestion of nitrogen containing fertilizer picked up off lawns (mistaken for seed), or of water birds during a green algal bloom.

Individual poisoning of a possum that consumes rat poison/bait (commonly seen in possums).

Poisoning can also occur en masse where a poison or toxin is found in an area where a number of animals may come into contact with it (commonly seen in birds). Mass incidences of poisoning are usually reported when there are a number of the same or similar species found dead or dying in a relatively small area. The prognosis for these animals is generally poor. These incidences should be reported to the Department of Primary Industries and Fisheries (or equivalent State body) and if possible, the carcasses should be presented to a wildlife facility for necropsy and pathology. Unfortunately, there are limited funds available for thorough investigations to be made in these cases, particularly where it is an isolated occurrence and where it involves 'common' species. **Note**: When dealing with incidences of poisoning, remember personal safety above all else. Use appropriate PPE.

Unfortunately, some instances of wildlife poisoning appear to be deliberate.

The most common causes of poisoning in wildlife include rodenticide poisoning, botulism and tick poisoning (paralysis).

Rodenticide Poisoning

Poisoning from rodenticides occurs from either primary or secondary means.

Primary poisoning is caused when an animal eats the rodenticides directly. The most common occurrence is when a container of bait is placed where non-target species can gain easy access. Rat bait should always be placed in suitable containers where mice and rats can gain access but possums, bandicoots and other wildlife are unable to access the bait.

Secondary poisoning occurs when an animal eats another animal that has digested a toxin. This can occur when an animal such as a carnivorous bird (Tawny Frogmouths, raptors) eats an affected rodent that has been poisoned.

Treatment – Rodenticide Poisoning

The prognosis is for animals suffering from rodenticide poisoning is very poor. Treatment may be an option provided the animal receives immediate veterinary attention. Vitamin K injections are usually provided together with supportive treatment for other symptoms (such as fluid therapy, control of seizures/convulsions and pain relief). Sometimes a blood transfusion is required.

Botulism

Botulism is caused by a toxin produced by bacteria. The bacteria grow in stagnant water or decomposing organic material, particularly in warmer months. It commonly occurs in water birds. Early clinical signs include being unable to stand, and progress through to flaccid paralysis - being unable to hold the head up and laying with their wings outward. Affected animals may also be unable to move their eyelids leading to eye ulceration.

Treatment – Botulism

Animals showing early clinical signs of this condition may recover once removed from the source and given supportive care (e.g. fluids, electrolytes, warmth, antibiotics etc).

Animals in the later stage suffer from respiratory failure or cardiac paralysis and euthanasia usually is the most humane option.

Above: Seagull suspected as suffering from botulism. Birds often present in this position with their wings splayed and unable to get up.

Credit: Inland Seas Education Association (www.schoolship.org)

Tick paralysis/poisoning

Tick poisoning does occur in Australian wildlife, contrary to popular belief that all species are immune to the paralysis tick. Flying foxes commonly succumb to tick paralysis. Less commonly affected species include mammals (such as gliders) and birds. Animals that are incapacitated by injury or disease or that spend more time on the ground at certain times of the year (e.g. pale headed rosellas feeding on grass seed heads) may also become secondarily affected by a paralysis tick. Symptoms include weakness advancing to complete paralysis.

Treatment – Tick Poisoning

Treatment with paralysis tick anti-toxin must be commenced as soon as possible and the animal provided with supportive care.

These animals are high-demand patients and should be maintained at a wildlife hospital so that supportive care including oxygen therapy, intravenous therapy and assisted breathing (mechanical ventilation) can be provided if needed.

Definition

Myopathy is a term that literally means "muscle disease". It occurs when the muscle fibres break down and release their contents into the blood stream. As a consequence, high levels of potassium, a muscle protein "myoglobin" and other toxic compounds build up in the blood causing potentially fatal metabolic problems. There is also inflammation, pain, swelling and loss of function in the muscle groups affected.

In severe cases of myopathy, many muscle groups can be affected, and the disease may also cause irreversible damage to the heart muscle. Severe cases may result in acute death or kidney damage (nephropathy) due to the high levels of myoglobin in the blood, which block the filtering tubes in the kidney and tend to "clog" them up. Myopathy is a life-threatening disease that should be detected and treated early. (Source: Dr J Hanger – Diseases of Hand-Reared Macropods)

It occurs commonly in macropods; however, some birds can also suffer from this condition.

Symptoms

The clinical signs of myopathy may include any one or more of the following:

Mild cases

- Lethargy
- Floppy neck
- Standing in a hunched position with head hanging near ground
- Teeth grinding

Moderate and Severe cases

- All of the above signs

PLUS

- excessive salvation
- rapid respiration
- heart rate
- stiffening of the leg muscles
- sudden death

Acute cases may progress to convulsions and death within hours. Those that recover may sustain severe damage to the heart muscle leading to cardiac arrhythmias and congestive heart failure.

There is usually a history of a traumatic or stressful event that precedes the onset of symptoms.

Treatment

Diagnosis is generally made by a combination of:

- obtaining an accurate history of the rescue/capture of the animal and/or its subsequent care (including housing, transportation etc).
- clinical signs
- urinalysis
- blood testing (if possible)

Treatment of acute cases involves the control of seizures with diazepam, fluid therapy and pain relief.

Prevention of further muscle damage can be assisted by administering Vitamin E and Selenium. This medication used to be available as a combined injectable medication that your veterinarian could administer but is no longer available in Australia. Alternative treatments include oral Vitamin E and Selenium or injectable solutions that contain Vitamin E with other vitamins (e.g. ADEC) and injectable selenium on its own.

Animals in severe stages of myopathy have a very poor prognosis. Once the muscle damage has started, it cannot be reversed. Often euthanasia is the most humane option.

Refer to paper by Dr. Jonathan Hanger 'Diseases of Hand-reared Orphaned Macropods'.

Above: Red-necked Wallaby suffering from myopathy. The myopathy was caused by being housed in a veterinary clinic with dogs overnight and resulted in paralysis of the hand legs. Unfortunately the myopathy was too advanced and had resulted in permanent kidney and heart damage and was euthanased.

Credit: Karen Scott

Most species of wildlife harbor some form of external parasite. Healthy wild animals are generally able to tolerate a low burden of ectoparasites which does not normally interfere with the animal's ability to survive. However, when an animal becomes sick or injured, the parasite burden can increase and may seriously compromise the animal's health. Treatment may be required to prevent the animal becoming more debilitated.

Recognising ectoparasites

Some common parasites found on Australian wildlife include:

Lice

Lice complete their entire life cycle on their hosts. They are about 3mm in size. The adult's mate on the host and the female then attaches her eggs, called nits, on the feathers or hairs of the host. Nits are white and about 1mm in size. These later hatch into nymphs. Lice are transmitted through direct contact between an infected host and an uninfected individual.

Mites

Mites are microscopic organisms found in and under the skin and on the hair follicles. Mites are diagnosed by taking a sample of hair and/or skin and examining it under a microscope. Once the species of mite has been diagnosed, appropriate treatment can be provided.

Ticks

Ticks are bloodsucking parasites that engorge themselves on their host's blood and then fall back into the environment. Unfed nymphs may be as small as 3mm with the engorged adults being many times larger. Transmission is indirect and occurs when an animal enters an area that harbours nymphs or adult ticks. Ticks often lie in wait on vegetation or leaf litter and will climb on to any animal that brushes past them. They are easily identified when attached to the skin.

It is important to understand that some Australian wildlife species are natural hosts for ticks. For example, the echidna and bandicoots are natural hosts, including the paralysis tick.

It is also important to remember that young wildlife being hand-raised need to develop a natural immunity to ticks so it is important that they have some controlled exposure to ticks during their development (e.g. allowing them to go outside and spend time on grass etc).

High burdens of ticks can cause anaemia which can be diagnosed by a veterinarian by way of a blood test.

Flat Flies (Hippoboscid insects)

Commonly infest Australian mammals and birds. Named 'flat flies' because their body is flattened so that they can better fit into gaps between the feathers and fur. They have strong sharp claws that cling to the skin. They feed on the blood of their host.

Bat flies (Nycteribid insects)

Are wingless flies that look similar to a spider. They have a flattened body and have no eyes or wings. They live on both mega and microbat species. They feed on the blood of their host.

Treatment

Treatment is generally only required when the animal has a heavy burden of external parasites. Treatment may be used to prevent the spread of parasites to other animals in care and/or to humans. Whilst most parasites do not pose a significant human health risk (although they are often annoying), some people may suffer from a severe allergic reaction, particularly to ticks.

Treatment of wildlife for external parasites should always be in consultation with a veterinarian.

Birds

If the bird is heavily infested with ectoparasites it may be indicative that the bird has been ill for some time. There are a number of preparations commercially available to treat bird lice and mites (e.g. Mite & Lice Spray®) and are available at pet shops. Ensure that you use a product that is specifically designed for birds. Use sprays carefully – be careful applying to the face area. Use a cotton bud sprayed with the solution around the eyes, nostrils and beak.

When treating the bird, ensure that you also clean and treat the enclosure to prevent re-infestation.

Mammals

To treat lice and ticks in mammals, use Permoxin® insecticide. This is available at pet shops and veterinary clinics. Follow the manufacturer's directions to dilute. For small animals, spray a fine-toothed comb (head-lice combs work well) and comb through the animal's fur. For larger animals (such as fully furred macropod joeys and adult possums) you can apply a fine spray of the solution to the animal's fur. Parting or brushing the fur assists with application. Be careful around the face area.

Once treated, replace all linen and clean bags and baskets to help prevent re-infestation.

Reptiles

Ticks:

Ticks can be normal on healthy reptiles in small numbers. The most common ticks found on reptiles are *Amblyomma* spp., *Bothriocroton* spp. and *Haemaphysalis* spp from the Ixodidae tick family (hard or scale ticks) which have a hard shield on their back. Soft ticks (from the family Argasidae) may also be seen but are less common than hard ticks. Most ticks are species specific on reptiles.

Some ticks are quite visible, while others will be inconspicuous – between folds in the skin, in between scales, in the ears, nostrils or around the cloaca.

If removal of ticks is required (i.e. heavy burdens or in sick reptiles,) manual removal of ticks is the quickest and easiest method. Grasp the tick as close to the body as you can with tweezers or forceps and pull the tick off. As a nymph and larval stage, ticks are often too small to be seen with the naked eye, the reptile should be treated with a suitable product once visible ticks have been manually removed.

Permethrin products (e.g. Permoxin®) can be used to treat ticks and mites but an overdose can easily occur if used incorrectly, resulting in death. Product directions must be followed.

Mites:

Mites are often found on reptiles and can cause many serious illnesses if the reptile has a heavy burdened. Mites can quickly overwhelm the reptile and easily spread to other reptiles in care.

Soaking the reptile in water will drown the mites on the body but will miss the ones present on their heads. Vegetable oil can be applied to areas of the head (paying particular attention to labial pits and ears etc). Mite spray formulated for reptiles (Reptile Mite Spray®) can be applied to the animal.

Enclosures must be thoroughly disinfected and sprayed at the type of treatment of the animal with a suitable insecticide such as 'Top of Descent®'. Allow the enclosure to air before returning the reptile. Always follow manufacturer's directions.

Native wildlife usually live with some level of internal parasite load. In healthy wild animals, these parasites do not cause health concerns or clinical signs and there should be no need to routinely treat wildlife for internal parasites.

However, there are occasions when internal parasites do become a problem, particularly during the the rehabilitation process if an animal is affected by other disease or injury. Internal parasites may be treated when they cause health concerns or where there is a health risk to other animals in care.

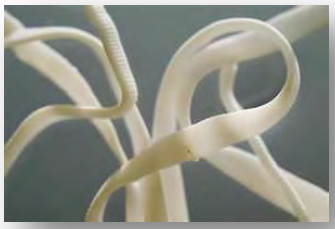
The most common internal parasite encountered with wildlife is gastrointestinal worms. Other forms of internal parasites include protozoa and blood parasites (these are relatively uncommon). There are many types of parasites are species-specific. It is important that you are aware of the most common ones found in the species that you are caring for.

. Refer to specific training manuals for more detailed information.

Symptoms

Symptoms will vary between species and individuals but may include:

- Diarrhoea
- Weight loss
- Lack of weight gain
- Anaemia
- Low blood protein (determined by vet)
- Parents unwilling to feed young



Cause

Heavy burdens may be caused by:

- Poor hygiene (not picking up faeces or cleaning enclosures and feed bowls correctly)
- Environmental conditions (e.g. long periods of rain)
- Over-crowding in enclosures
- Exposure to another individual(s) with a heavy burden

Treatment

Treatment will be dependent upon the type of internal parasite.

A fresh faecal sample should be taken to your veterinarian who will conduct a faecal test to identify the gastrointestinal parasite. The veterinarian will then prescribe an appropriate parasitic treatment.

It is important to follow the veterinarian's instructions carefully. Most treatments will involve multiple doses over a set period of time to ensure that all stages of the parasite are killed.

Skin conditions may be seen in all species of wildlife. Common skin conditions frequently found on wildlife that have just come into care include dermatitis, fungal infections, ringworm and avian pox. It is important that you understand the most common conditions found in the species that you are caring for.

Skin conditions unfortunately also commonly develop during the rehabilitation process. Orphaned joeys seem to be particularly prone to developing alopecia (hair loss). This hair loss is generally associated with bacterial/fungal infections (often associated with diarrhoea and poor hygiene) and/or dietary problems (such as milk intolerance or inappropriate foods being provided).

Symptoms

Skin conditions can be identified as simply being any condition where the skin or fur/feathers is not normal. It may be indicated by the lack of fur/feathers, dry skin, inflamed skin, lesions, abscesses etc.

Zoonoses

Some diseases and conditions can pass from animals to humans. These are referred to as zoonotic conditions. It is important that any animal that comes into care with a skin condition is quarantined immediately and strict hygiene is established. You should treat all such cases as if they were highly contagious until it is proven otherwise.

Common skin conditions that are contagious from animal to animal and from animal to human include:

- Fungal infections (such as ringworm)
- Bacterial infections

Treatment

Having an accurate diagnosis of the skin condition, as determined by your vet, is essential for rapid treatment and recovery.

Your veterinarian will take a small sample of hair, or the surface skin cells (through a skin scrape) in the affected area and examine it under a microscope. In some instances, a sample may be sent away to a laboratory for further testing.

Treatment of skin conditions may include:

- Antibiotic treatment (which will be dependent upon the cause of the condition)
- Regular baths with medicated shampoos (e.g. Malaseb®)
- Topical treatments (creams, ointments etc) (e.g. Surolan®)

If the condition is caused by poor management, then this needs to be addressed by the rehabilitator.

Top Left: Koala joey which came into care with his mother who was suffering from a severe fungal infection which resulted in the joey also suffering from the same condition. The joey was rejected by the mother and he was treated and hand-reared. Top Right: The same koala several months later showing a success treatment outcome.

Credit: Karen Scott (top left) and Laura Reeder (top right)

Above: Red Kangaroo joey which was raised by members of the public for several weeks. The joey was suffering from ringworm and was succesfully treated.

Credit: Roy Webster

For more examples of skin conditions refer to the Section Assessment – Skin.

Flystrike occurs when flies lay their eggs on the body of an animal. These subsequently hatch and maggots emerge to feed on decaying skin or tissue. Depending on the time passed since fly eggs were laid, injured wildlife may be affected by small or large maggots (maggots grow rapidly once they begin feeding).

Any animal that is seen with flies around it should receive a thorough assessment as there is generally an attractant for the flies to lay their eggs (e.g. open wound).

Recognition Flies affect their hosts during two phases of their life cycle. The adult flies feed on blood, tears or mucous. Adult flies vary from the small sand fly (1 to 3mm in size) to the larger horse fly (up to 3.5cm in length). The area around which the flies are feeding on becomes irritated and inflamed and this can be a good indicator that flies present. The feeding flies may then lay their eggs in the inflamed tissues. Once the eggs hatch, the larvae (maggots) develop in the tissue and can be seen as small white, worm-like structures which grow rapidly.

Treatment

Injured wildlife will often present with either eggs or maggots. While maggots can aid in the removal of necrotic tissue in controlled treatments, they will also inflame and irritate healthy tissue, subsequently enlarging the affected area. Over time maggots can also expose the area to secondary infections and result in the death of the animal. It is important that maggots and their eggs are removed as soon as possible.

It is important to be aware that maggots can enter a wound through the tiniest of openings.

Maggots will also seek dark moist areas and are often found in the ears, eyes, mouth, cloaca/vent and around the wing area (close to the body).

A thorough assessment is critical in order to identify the presence of maggots.

To remove maggots, flush the wounds with warmed saline solution. You may need to use a syringe to penetrate deep into wounds to eject all of the maggots. For hard-to-reach wounds or if there are some residual maggots that cannot be flushed out, some success has been obtained by filling the wound with Flamazine® cream (previously Silvazine® cream). The maggots will generally exit the wound voluntarily and they can then be picked off with tweezers. Flush the wound again with saline.

Injectable parasitic treatments can also assist with maggot removal and can be prescribe by your veterinarian.

Prevention of Fly Strike

If you have an animal or bird in care that has an open wound, it is imperative that it is kept indoors or in a fly-resistant enclosure. Fly strike (or maggot infestation) can happen very quickly and can interfere with the animal's healing.

Enclosures should be covered in fine netting or fly screen and a regular check of the animal's wounds undertaken to ensure that they have not become fly blown.

Flystrike in sick and injured wildlife whilst in care is generally as a result of poor housing choses and poor management.

Above – Common Ringtail Possum
The small white particulars are fly eggs.
Credit – Karen Scott

Above – Black Flying Fox
The wings of bats and the area where the wing membrane joins the body are common places for maggots to invade. A full assessment should include these areas.
Credit – Trish Wimberley

Above – Tawny Frogmouth
The brown area is thousands of tiny just-hatched maggots invading an open wound on the chest.
Credit – AZWH

Above – Eastern Water Dragon
The white oblong shapes are maggots.
Credit – AZWH

Left – Brushtail Possum joey covered in fly eggs. Note the eggs are in the ears. These need to be removed urgently.

Credit: AZWH

Definition

Gastrointestinal obstruction occurs when there is a blockage in the gastrointestinal (GI) tract. It can be anywhere along the length of the small and large bowel and may sometimes involve the stomach. Commonly, the areas above the level of the obstruction become distended with the build-up of gas and ingesta as they are unable to pass through the gastrointestinal tract. Gastrointestinal obstruction is also commonly referred to as an intestinal obstruction.

Causes

An intestinal obstruction may be a partial or complete, and in either the small intestine or large intestine/large bowel and may be caused by:

Foreign bodies

For example, tassels from cushions, small toys, teats, fibre or threads from pouches etc.

Intussusception

Intussusception occurs when one portion of the bowel slides inside itself, very much like the pieces of a telescope. When this occurs, it creates an obstruction in the animal's bowel, with the walls of the intestines pressing against one another. This in turn leads to swelling, inflammation, and decreased blood flow to the intestines, internal bleeding and eventually peritonitis. Infant animals such as koalas, possums and macropods are particularly prone to this.

Gastric dilatation-volvulus

Is an acute, life-threatening situation which requires immediate veterinary and surgical attention. Gastric dilatation means the stomach is distended or enlarged. This may or may not be accompanied by volvulus (twisting of the stomach or large intestine), torsion, or twisting of the stomach on its long axis.

Once the animal's stomach twists, the stomach contents are trapped and gas continues to build up inside the animal's stomach. As the stomach expands, it can compress major arteries and veins in the abdominal cavity, restricting blood flow and lowering blood pressure. Once this happens, the heart rate increases, and the pulse will become weak as the animal goes into shock.

If the stomach swells enough, it can displace the spleen, cutting off circulation, and causing enlargement and even twisting of the spleen. With the distention, blood supply to the stomach wall and lining becomes restricted and parts of the stomach wall can start to die. This can occur very quickly, within a matter of hours.

Neoplasia

A neoplasm is an abnormal mass of tissue, such as a tumour which may block the intestinal passage.

Symptoms

Some symptoms include:

- bloat or stomach distension
- pacing
- difficulty with walking or change in their normal gait
- refusing feeds
- panting
- diarrhoea
- discomfort – sometimes kicking of the stomach with the legs
- agitation
- depression
- drooling
- foaming or frothing at the mouth
- unproductive vomiting or retching
- high or low body temperature
- dehydration
- shock

As a result of gas build up in the areas above an obstruction, the abdomen commonly becomes overtly large and very tympanic (hard) to the touch. At this point the animal may start to show signs of shock which may include:

- pale mucous membranes
- slow/delayed capillary refill time
- increased heart rate
- weak pulse
- dullness or lethargy
- may become unconscious in advanced states

This is a life-threatening veterinary emergency that will require surgery in the attempt to save the animals life.

Definition

Intussusception is a prolapse of one part of the intestine into the lumen (cavity) of an immediately adjacent part, i.e. one portion of the bowel slides inside itself, very much like the pieces of a telescope. Intussusception can lead to reduced blood flow to the affected intestine and that portion of the bowel may begin to necrose. An intussusception can cause gastrointestinal obstruction. (See section above on Gastrointestinal Obstruction).

. Some cases of foreign body ingestion (e.g. fishing line, string, fabric from pouches or plastic materials) lead to concertinaing of the bowel and may precipitate an intussusception. In these cases one part of the foreign body becomes stuck in the bowel (e.g. at the base of tongue or the opening from the stomach into the small intestine) whilst the rest of the material travels further down the GI tract. Once the end of the material's length is reached, it can pull tight with the ongoing motility of the bowel causing the bowel to concertina. Over time this can cause a sawing or cutting motion in the GI tract and may result in intestinal perforation and peritonitis.

If left untreated, it can cause serious damage to the intestines, since their blood supply is cut off. Intestinal infection can occur, and the intestinal tissue can also die.

Recognition

Most mammals will exhibit one or multiple of the following symptoms:

- Vomiting
- Regurgitation
- Diarrhoea
- Reduced faecal output
- Anorexia or reduced interest in food
- Weight loss
- Non-specific abdominal discomfort/pain
- Black, "tarry" faeces that are associated with gastrointestinal haemorrhage.

Treatment

Radiography and ultrasound are the most useful tools for diagnosing an intussusception. In animals that have suffered but recovered from an intussusception, there is a reasonable risk of reoccurrence. Caution, diligent care and close observation are vitally important in the animal's rehabilitation.

Gastrointestinal obstruction and intussusception are life threatening conditions that commonly need to be corrected with surgery. Other treatments include appropriate antibiotics, intravenous fluid therapy and diligent nursing and veterinary care. The mortality rate is often high.

Definition

Gastroenteritis is the inflammation of the lining of the stomach and intestine (gastrointestinal tract). It is usually caused by infection with a microorganism (viral or bacterial) but can also be caused by the ingestion of chemical toxins or drugs that irritate the lining of the intestinal organs, or through parasitic or protozoal (e.g. Giardia, coccidia) infections.

It can be life threatening and urgent veterinary treatment is required.

Symptoms

The main symptom of gastroenteritis in animals is diarrhoea. When the colon (large intestine) becomes infected during gastroenteritis, it loses its ability to retain fluids which causes the animals faeces to become watery. Other symptoms can include:

- Abdominal pain or cramping
- Nausea
- Vomiting
- Bloody diarrhoea or loose faeces
- Fever
- Reduction in food intake
- Refusing bottle feeds
- Unintentional weight loss (may be a sign of dehydration)
- Clammy skin
- Muscle pain or joint stiffness
- Incontinence (loss of bowel control)
- Tooth grinding

Zoonotic risk

Certain forms of gastroenteritis, such as viral gastroenteritis, can be highly contagious.

Some causes of gastroenteritis in animals can be contracted by humans and vice versa. Infection occurs by ingestion of faecal particles. Poor hygiene is the primary cause of infection e.g. humans not washing their hands thoroughly after going to the bathroom, or insufficient cleaning of bedding in an infected animal and lack of handwashing by the carer.

Gastrointestinal infections can also occur through ingestion of contaminated water. All water and food dishes used for animals should be washed thoroughly in clean water after use. Fresh clean water should be provided daily and be changed anytime it becomes contaminated with faeces.

In some cases, gastroenteritis is acquired through contact with other animals that are carrying the infectious microorganism. If you suspect your animal is ill; or if you are receiving animals into care from other rehabilitators: it is always essential to quarantine the new animal from the others in your care for a few days.

Common routes of infection include:

- Food
- Contaminated water
- Contact with an infected human or animal
- Unwashed hands
- Dirty utensils such as feeding and water dishes

Because the primary symptom is diarrhoea, animals that have gastroenteritis can become dehydrated very quickly. It is very important to watch for signs of dehydration, which include extreme thirst, urine that is dark in colour and strong smelling, dry skin and mouth, sunken cheeks or eyes, tacky skin and/or skin tenting.

Treatment

Once the cause of gastroenteritis has been diagnosed by your vet (often through faecal examination) treatment may include:

- Fluids – orally (water or electrolyte soluctions), subcutaneaous or intravenously in severe cases.
- Gastrointestinal protectants – peptosyl, carafate etc.
- Pain relief
- Antibiotics
- Antifungals – to prevent the onset of candida
- Antiprotozoals – in cases of protozoal infections.
- Keeping the animal warm and quiet to aid in its recovery.

Although gastroenteritis is not usually serious in a healthy animal, in an infant or an animal that is already compromised it can be life threatening if the animal becomes dehydrated and suffers from an electrolyte imbalance.

Definition

Diarrhoea is defined as the rapid movement of faecal matter through the intestine resulting in poor absorption of water, nutritive elements and electrolytes and results in frequent evacuation of watery droppings/faeces.

Cause

Diarrhoea is one of the most common conditions associated seen in wildlife undergoing rehabilitation. Animals will periodically come into care with diarrhoea, but largely it is a condition that develops during the care process.

There are a large number of diseases and conditions where diarrhoea is a clinical sign. It is essential that the cause of the diarrhoea is established. Remember, diarrhoea is a SYMPTOM not a disease in itself.

Common causes of diarrhoea include:

- Stress
- Intolerance to milk formula
- Overfeeding
- Bacterial infections
- Yeast infection (Candida)
- Rich green grass
- Worms
- Coccidia or other protozoal infections
- Gastrointestinal conditions – e.g. intussusception
- Introduction of new foods
- Inappropriate foods e.g. rolled oats, fruit, 'human' foods

If your animal develops diarrhoea, it is imperative that you have it examined by a vet as soon as possible. Delaying assessment is negligent and could jeopardise the animal's health long term. It is unacceptable to take the "*I'll wait and see what happens*" approach.

Where diarrhoea is caused by a disease process such as candida, coccidia or a bacterial infection, it is imperative that a prompt diagnosis is made, appropriate treatment provided and started as soon as possible to ensure that the animal has the best chance of surviving.

Treatment

Your veterinarian is the most appropriate person to diagnose the cause of diarrhea. They have the capacity to perform specific tests and access methods to determine the cause of the diarrhea. Diagnosis should never be made by a wildlife rehabilitator. You cannot diagnose the cause simply by the appearance, colour or smell of the faeces.

A veterinarian will conduct faecal tests including:

- Faecal float – identifies worms and coccidia
- Faecal smear – identifies bacteria, candida etc.

In cases, where the animal has recurring bouts of diarrhoea, the veterinarian may send a faecal sample to a laboratory for more comprehensive diagnosis and to establish the most appropriate antibiotic to treat the underlying cause.

Treatment may include:

- Fluids – orally (water or electrolyte solutions Spark® (for birds) and Lectade® (for mammals), subcutaneous or intravenously in severe cases.
- Antifungals – to prevent the onset of candida
- Antibiotics
- Antiprotozoals – in cases of protozoal infections.
- Gastrointestinal protectants – peptosyl, carafate etc.
- Pain relief

Animals that are moderately dehydrated may need subcutaneous fluid therapy. Part of the Treatment Plan provided by your veterinarian to treat the diarrhoea should involve a fluid therapy plan.

Definition

Peritonitis is defined as inflammation of the peritoneum (a serous membrane which lines the abdominal cavity and some of the organs it contains). Peritonitis can be localized (to one area) or generalized (infecting the whole intestines and organs within the animal's body).

Cause

Peritonitis can be induced through infectious and non-infections causes. It can be referred to as septic (bacterial involvement) and non-septic peritonitis. Non-infectious causes commonly include trauma, where the peritoneum is traumatized, bleeds and becomes inflamed as a result. It may also preclude an infectious peritonitis e.g. where a damaged gastrointestinal tract starts to leak, resulting in bacteria entering the peritoneal cavity and inducting septic peritonitis.

Other infectious causes include penetrating injuries to the abdomen e.g. during a dog attack, or other penetrating foreign body.

Symptoms

The symptoms of peritonitis can vary and sometimes resemble the symptoms of other illness and disease's that effect animals, but can include:

- Severe abdominal pain, aggravated by any motion
- Refusal of feeds
- Nausea and vomiting
- High temperature
- Listless
- Abdominal tenderness or distention
- Fluid in the abdomen
- Shock

Treatment

In order to provide the most suitable treatment, the cause of the peritonitis must be identified. This is achieved through a clinical examination, abdominocentesis (aspiration of some abdominal fluid for examination), radiographs, ultrasound and blood analysis.

Treatment options include:

- Supportive care (in non-septic and non-infectious cases)
- Surgical exploration and repair (exploratory laparotomy) – in cases of septic peritonitis or those that require manual repair (to find the infected organ/s and remove or clean the infected area).
- Fluids
- Analgesia/pain relief
- Antibiotics - choice will depend upon the severity of the condition.

Peritonitis is a life-threatening condition and a veterinary emergency. Treatment needs to be aggressive.

Definition

Prolapse refers to the 'falling down or slipping of a body part from its normal position'. The most common prolapse seen in wildlife is a rectal or cloacal prolapse which occurs when one or more layers of the rectum protrude through the cloaca or vent due to weakening or stretching of the internal structures.

Cause

There are many causes for prolapse, but the main causes in wildlife rehabilitation include:

- Prolapse caused by trauma (e.g. road trauma or domestic animal attack)
- Overzealous toileting by rehabilitators
- Persistent diarrhoea or ongoing gastrointestinal disorders

A prolapse can be a fairly mild condition but can also become serious if not rectified promptly. Irreversible damage can occur to the tissues of a prolapse if the condition is not treated appropriately and rapidly. Prompt treatment is essential to enable the best chance of recovery. A delay in treatment risks the blood supply to the prolapsed organ which can cause the protruding organ to become necrotic, potentially resulting in euthanasia.

A prolapse of the cloaca in a trauma victim is suggestive of more severe abdominal injury and often warrants abdominal surgery.

Treatment

A prolapse is a veterinary emergency and veterinary assistance must be sought immediately. In the interim wet the protruding tissues with 0.9% sodium chloride or plain water and cover liberally with sugar (plain white granulated sugar is best). Sugar will absorb excess fluid from the prolapsed organ and reduce the swelling in the prolapse. This may be sufficient to allow the body to retract the prolapse spontaneously but will also assist with manual replacement of the organ (by a vet).

In some instances, the prolapsed organ will need to be held in place with sutures until normal function returns.

Figbird with prolapse.
Photos show initial prolapse (top left) and treatment (saline soaked cotton swab with plain white sugar) to reduce the swelling. Photo (right) shows prolapse after treatment.
Credit: Karen Scott

Calcium homeostasis is the mechanism by which the animal's body maintains adequate calcium levels. When this process is interrupted it can lead to hypocalcaemia (extremely low calcium in the blood) or hypercalcemia (extremely high levels of calcium in the blood), both of which can have important consequences for the animal's health.

Calcium is the most abundant mineral in the animal's body. The amount of calcium required by a species varies greatly, with birds requiring the most of all. The size of the species, their metabolism and what they need calcium for (such as shell development, bone formation) will define how much each species requires.

Causes

Calcium deficiencies can be inherited or caused by disease but the most common cause in native animals of all species is an inadequate diet and lack of sunlight. These causes are often a result of poor management.

Metabolic bone disease is one of the most common conditions associated with calcium deficiency and in most cases is caused by our failure to understand the natural history of the species that we are caring for.

Healthy wild animals living in the wild would rarely succumb to metabolic bone disease. Exceptions to this are the young of some species of bird (e.g. butcherbirds, magpies etc) that are frequently fed raw meat by the public. Meat (without bone fragments) does not contain calcium and when fed to developing young by the parents they do not receive sufficient calcium for bone development. Apart from this example, calcium deficiency is largely a condition of being in care. Animals reared in captivity without a balanced diet/formula or without sufficient ultraviolet exposure can develop weakening of the bones through calcium deficiency.

Calcium is essential for the health of our wildlife for the following reasons:

- It interacts with phosphorus to form calcium phosphate; this is the hard, dense material which forms bone, shell and teeth. It is vital for shell and egg production.
- Calcium is essential for fluid exchange, blood clotting and for maintaining a regular heartbeat.
- It is important for muscle contraction and metabolic function.

Symptoms

- Weakness
- Bone breakage or bending
- Loss of vision
- Cataracts
- Poor fur growth or loss or thinning of fur
- Lethargy

It is important for all rehabilitators to realize the importance of adequate calcium in an animal's diet. A poor diet, inadequate housing and stress can result in the death or euthanasia of the animal in your care.

Treatment

Wildlife with advanced signs of calcium deficiency/disorder have a very poor prognosis.

Your veterinarian may diagnose the extent of the calcium deficiency using radiographs to examine bone density and look for fractures. This is a condition that is best treated by PREVENTION. Wildlife rehabilitators should have a very good understanding of the dietary requirements of the species that they are caring for.

Section 4

Hygiene, Quarantine and Zoonotic Diseases

Bearded Dragon

Credit: Karen Scott

All sick, injured and orphaned wildlife will suffer from varying degrees of stress whilst in care. They are often in pain, frightened, confined, subjected to handling, foreign foods and smells.

Stress depletes the immune system - therefore we must understand that wildlife will be more susceptible to infection during their rehabilitation.

It is imperative to have a high standard of hygiene across all areas when rescuing and caring for wildlife to minimise the risk of infection and disease to the animal, other animals in your care, as well as yourself and other household members.

In this Section, we discuss the principles of quarantine, general husbandry and management to ensure a high standard of hygiene.

Infectious Disease

Infectious diseases are caused by micro-organisms, commonly bacteria, viruses, fungi and protozoa.

A contagious disease is a disease which is capable of transmission by direct or indirect contact from one animal to another.

A non-infectious disease is one that does not involve micro-organisms and is not transmissible.

How contagious diseases are spread

The key ***exit routes*** for infectious organisms are through bodily secretions and excretions, including:

- Oral, nasal and ocular discharges
- Urine
- Faeces
- Vomitus
- Blood
- Skin
- In utero
- Mammary secretions including milk
- Birth related fluids

The routes of infection to a ***new host*** include:

- **Ingestion** – including contaminated food and water, contaminated body parts used for eating (i.e. hands and feet) and through mutual grooming.

- **Inhalation** - including inhaling contaminated particles that have been sneezed or coughed out by an infected individual or through inhalation of contaminated dust/environmental particles including bedding.

- **Through the skin** – particularly when skin is broken during fighting or through transmission via mites, lice, ticks or other biting insects.

Covid-19

Wildcare volunteers must keep up to date with current health directives from both Federal and State Governments as well as health organisations. Included below are relevant links to keep appraised of current best practices:

Australian Government – Department of Health
https://www.health.gov.au/

Queensland Government – Covid-19
https://www.covid19.qld.gov.au/

World Health Organisation
https://www.who.int/

Wildlife Health Australia
https://www.wildlifehealthaustralia.com.au/Home.aspx
WHA is the coordinating body for wildlife health in Australia.
The WHA website includes information on Covid-19 and up to date information on recommended precautions when dealing with wildlife.
As of January 2021, the current WHA Fact Sheet can be found at the link below:
https://www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Public%20health/Covid-2019.pdf

Quarantine

The terms ***quarantine*** and ***isolation*** both refer to the separation and segregation of animals to protect and prevent the transfer of infectious disease. This means that an animal which is infected, or is suspected of being infected, is housed in such a way as to prevent other animals coming into contact with the disease-causing organisms. (Lane & Cooper, *Veterinary Nursing).*

All animals admitted into care should be placed into quarantine until confirmed they are not suffering from a contagious disease.

Some points to note:-

- Ideally, only one rehabilitator should deal with the infected animal and they should not handle any other animals. This of course is not always possible when dealing with native wildlife, therefore precautionary measures should be put in place to avoid disease transmission.
- An isolation or quarantine room or building should be utilised where only infected animals are housed.
- A footbath should be used at the entrance of the isolation unit and should contain a freshly prepared disinfectant solution. The disinfectant type will depend upon the organism present.
- All hygiene procedures should be carried out using disinfectants known to be effective against the particular disease of concern and used at the appropriate dilution. Follow the manufacturer's directions carefully.
- A change of protective clothing should be available in a suitable area at the entrance to the isolated enclosure. The type of clothing depends upon the disease, but may include an over-shirt, apron, disposable gloves, rubber boots and face mask.
- Newly arrived animals should be fed and treated last.
- Healthy animals should be tended to before sick animals and ideally housed in a completely separate facility/building.

Wearing Gloves

Always keep a supply of good quality latex gloves on hand. Gloves should generally be worn when:

- Handling blood or body fluids.
- Handling equipment or materials contaminated with blood or body fluids.
- Touching mucous membranes.
- Touching non-intact skin.
- Administering intravenous injections.
- Performing any invasive procedure.

Gloves should be changed after handling one animal and before handling another and/or between tasks.

Hands must be washed with soap and a suitable sanitiser after removing gloves.

After use, ensure that used gloves are disposed of appropriately in a bin.

Handwashing and Hand sanitising

Thorough hand washing is the best way to prevent transmission of infectious organisms and should be practised diligently.

Use a good quality antiseptic hand-wash for everyday tasks. When dealing with diseased animals, it is recommended that you use Chlorhexidine Surgical Hand Wash® or similar.

Wash hands:

- After handling each animal and before handling another animal
- After contact with dirty/used equipment and bedding materials
- As soon as possible after exposure to blood or body fluids
- Before preparing food
- After removing gloves
- Before and after going to the toilet

If your hands are not dirty (i.e. covered in debris) you can use a waterless hand sanitiser if you do not have ready access to running water and soap.

Since the outbreak of Covid-19 handwashing and sanitising procedures have been updated. The World Health Organisation has comprehensive information on their website on correct procedures.

https://www.who.int/

The poster on the following page outlines the recommended procedure to wash your hands correctly.

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds

0

Wet hands with water;

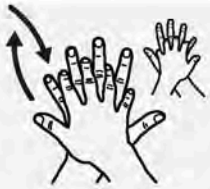
1

Apply enough soap to cover all hand surfaces;

2

Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4

Palm to palm with fingers interlaced;

5

Backs of fingers to opposing palms with fingers interlocked;

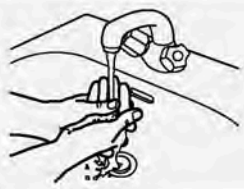
6

Rotational rubbing of left thumb clasped in right palm and vice versa;

7

Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8

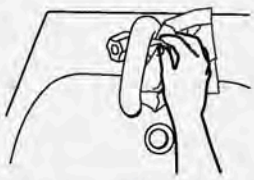


Rinse hands with water;

9

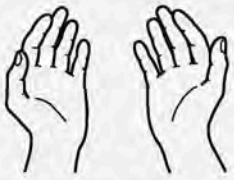
Dry hands thoroughly with a single use towel;

10



Use towel to turn off faucet;

11



Your hands are now safe.

World Health Organization | Patient Safety — A World Alliance for Safer Health Care | SAVE LIVES Clean Your Hands

Disposal of Sharps

All needles, contaminated syringes, scalpel blades and tranquilising darts must be disposed of in an appropriate manner by safely depositing them in a Sharps container.

If you use needles and syringes for wildlife, you should have a Sharps container specifically for the purpose of disposing of these items. These are available from chemists or Wildcare.

Once full, sharps containers should be disposed of in an appropriate manner. Your local Council will be able to tell you the location of appropriate drop-off points.

Sharps Containers – all wildlife carers using needles should have one on hand for safe disposal.

Credit: Karen Scott

Foot Baths

Foot baths or foot bathmats placed on the outside of each aviary/enclosure are commonly used in wildlife facilities.

Some disinfectants commonly used include F10® or Virkon®.

When entering an enclosure, stand in the bath to ensure that the soles of both shoes are covered in the solution. When exiting the same procedure is followed.

Alternatively, a spray bottle with the concentration of F10® or bleach can be used to thoroughly spray the bottom of your shoes when entering and exiting the enclosure. This method may be easier to manage in a home rehabilitation situation.

Australia Zoo Wildlife Hospital Quarantine Facilities - Foot baths are placed at the entrance to each enclosure. It is important that the entire sole of the shoe is placed in the bath to ensure complete coverage.

Credit: Karen Scott (AZWH)

Cleaning Aviaries, Enclosures and Equipment

The appropriate and thorough cleaning of enclosures and rescue cages and equipment will help prevent the spread of disease. Cleaning enclosures and equipment between animals will also reduce stress by removing the scent/smell of the animal which previously occupied the enclosure.

Follow the suggested protocols below when cleaning aviaries and enclosures:

Disinfectants

A suitable disinfectant should be used to disinfect cages, aviaries, enclosures and all furnishings. For infectious diseases, it is imperative a disinfectant is chosen which will eliminate the particular bacteria or fungus.

Common disinfectants used by wildlife rehabilitators and wildlife facilities include:-

- F10®
- Virkon®
- Clinikill®
- Microcide®
- Household bleach
- Commercial disinfectants such as Pine-O-Clean® or Domestos®

Always follow the manufacturer's instructions when using disinfectants and remember:

- making the concentration stronger does not make it more effective – follow the manufacturer's instructions.
- Take note of the 'contact time' – ensure that the disinfectant is left on for the required time before rinsing.
- The item being disinfected needs to be clean first, disinfectants will not work where there is still organic material present (i.e. dirt, faeces, urine).

Cleaning small cages and enclosures

- Remove the animal from the cage/enclosure and place it securely into a holding cage.
- Remove all food dishes and cage furnishings (e.g. branches, browse, rocks, logs).
- If using newspaper to line the enclosure, spray the newspaper with water (a spray bottle containing tap water is a handy item). This helps prevent you breathing in disturbed contaminants when cleaning the cage.
- Fold the newspaper carefully and remove from the enclosure. Place removed newspaper into a bin.
- Scrub the enclosure and the furnishings with a mixture of warm-hot water and good quality dishwashing detergent.
- Ensure that all faecal and food matter is removed.
- Hose the enclosure to remove all traces of the faecal/food matter and detergent.
- Spray the enclosure with a solution of F10®.
- Following the manufacturer's directions – leave the F10® solution on for 30 minutes and then hose off. (Note: the F10® solution can be left to dry without hosing).
- Leave the cage/enclosure in the sun to dry for at least one hour.

Cleaning large Cages and Aviaries – Concrete Floor

- Remove all food and water dishes.
- Remove all furnishings from the floor area (such as logs, branches, tree stands).
- Collect all loose faecal, food or vegetation matter from the floor with an outdoor broom and dispose of appropriately in a bin.
- Hose the floor and walls of the aviary – ensure that the entire surface is wet.
- Use detergent and water to scrub floors, walls and branches
- Using a stiff scrubbing brush (one on a broom handle is easier) thoroughly scrub the floor of the aviary to ensure that all faecal and food matter is loosened.
- To clean the walls of the aviary use a sponge or soft scrubbing brush to remove any faecal or food matter.
- Hose the floor and walls to remove all detergent and loose matter.
- Using a spray bottle – spray the floor, walls and branches with a suitable disinfectant and leave to dry.
- Ensure that the loose matter hosed from the aviary is PICKED UP. Do not allow it to accumulate outside the aviary. It should be safely disposed of in a garbage bag.

Outdoor aviary with concrete floor (prior to cleaning).

Credit: Karen Scott (AZWH)

Cleaning large cages and aviaries – Natural Floor Substrate (Soil, River Sand)

- Remove all food and water dishes.
- Remove all moveable furnishings from the enclosure (such as logs, branches, tree stands).
- Rake the enclosure floor. Pay particular attention to areas where animals frequently defecate.
- If the floor consists of river sand, sift the raked loose matter through a plastic garden sieve (available from hardware stores). Return the sieved river sand to the floor of the enclosure.
- Scrub branches with soapy water and scrubbing brush to remove faecal matter and urine
- Hose branches and spray with disinfectant
- Collect the raked loose matter and dispose of in a garbage bag.
- Natural substrate floors will need to be periodically refreshed with clean, new fill as appropriate.

Outdoor enclosure with a river sand substrate (after cleaning).

Credit: Karen Scott (AZWH)

Plastic garden sieve available from Bunnings.

Credit: www.bunnings.com.au

Cleaning food and water Dishes

- Soak the dishes in a tub of warm-hot water and dishwashing detergent for at least 15 minutes.
- Scrub the food dishes thoroughly.
- Once clean, rinse or spray with F10® and leave to dry.

Cleaning removeable furnishings – Branches, Logs etc

- All removeable furnishings should be hosed under high pressure to remove any faecal or food matter and then scrubbed with warm-hot water with detergent.
- All removeable furnishings should then be sprayed with F10® or other disinfectant and left to dry.
- Leave in the sun to dry.

Tree Stands

If using tree stands, it is imperative that these are cleaned thoroughly on a regular basis. It is easy for faecal, urine and food matter to accumulate in the well of the stands.

In order to reduce the amount of matter accumulating in the stands, wrap the stands with a garbage bag or old towels. These are easier to dispose of or wash.

Credit: Karen Scott

Cleaning browse containers

Water containers (PVC pipes) for holding fresh browse need to be cleaned daily.

- Empty and rinse with a hose.
- Scrub with warm-hot water with detergent
- Round cob-web brushes or large toilet brushes are ideal for cleaning these.
- Rinse thoroughly with a hose.
- Spray with F10® solution.
- Leave for at least 5 minutes and then rinse and re-fill with fresh water.
- Once a week, clean thoroughly with warm-hot water with detergent and then fill with a household bleach and water solution. Leave for 20 minutes then rinse thoroughly.

Cleaning equipment

All stainless-steel equipment including scissors, scalpel handles, crop needles, etc should be thoroughly cleaned using the following procedure:

- Soak in water with good quality dishwashing detergent to help loosen food, blood, etc.
- Rinse under running water to remove excess debris.
- Wash in warm-hot water with good quality dishwashing detergent.
- Scrub the equipment using a scourer, soft scrubber brush, bottle brush, etc.
- Rinse thoroughly in tap water.
- Rinse or spray with F10® solution.
- Drain on a clean towel and allow to dry. F10® does not need to be rinsed.

Cleaning linen and bedding

All linen (including pouches, towels, sheets, blankets) should be thoroughly washed after EACH USE. Do not use towels on one animal and then for another animal without cleaning.

- Ensure all dirt, grass, faecal matter, etc is removed from the item and appropriately disposed of in a bin.
- Heavily soiled linen can be soaked in a nappy sanitising solution according to the manufacturer's directions.
- Wash the items in the washing machine using a good quality laundry detergent.
- Hang the items on the clothes line in the sun to dry.
- For items that have been used on animals suffering from skin infections (such as ringworm, dermatitis etc), many rehabilitators also use Canestan® in the rinse cycle. Follow the manufacturers' directions when using.

Zoonotic Diseases

A zoonotic disease is any disease that can be transferred from animals to humans, some with potentially fatal consequences. Methods to avoid zoonotic infections include:

- Good personal hygiene: washing hands after handling animals and before touching anything else that may come into contact with your mouth (for example, holding/chewing pens, handling food, etc).
- Do not allow animals to lick humans, particularly around the face and mouth.
- Always keep separate utensils for animal food preparation and human use and use separate areas for washing equipment etc.
- Pregnant wildlife rehabilitators should be extra vigilant about personal hygiene when in contact with animals.
- Clean up faeces and urine promptly.
- Wear protective clothing and change once soiled.
- Pay particular attention when cleaning enclosures to prevent inhaling airborne particulates from faeces. Wet down newspaper or enclosure substrate before removing/cleaning to help prevent inhalation.
- Seek medical advice if contamination is suspected.
- Use a waterless hand sanitiser on a regular basis where running water is not easily accessible.

Being a wildlife rescuer or carer will put you in direct contact with wildlife, some of which will be suffering from diseases that can be potentially harmful to you. Provided you are diligent with your hygiene and use appropriate PPE, the risks can be greatly minimised.

A summary of zoonotic diseases is included in the following pages which are known to be transmissible from native wildlife to humans. This list is not meant to alarm you but rather to ensure you are well aware of the potential risks and to emphasise the need to be diligent.

More in-depth information on zoonotic diseases can be found on the Australian Government website - https://www.healthdirect.gov.au/ or www.health.nsw.gov.au/Infectious/factsheets/.

The following information is extracted from the Queensland Health website.

Q Fever

Infectious Agent	*Coxiella burnetii.*
Host	Primarily cattle, sheep and goats but has been known to be carried by other animals such as kangaroos
Transmission	Transmission is through inhalation or ingestion of organisms excreted in milk, urine, faeces or during birth in infected animals, or that are aerosolized during necropsy or slaughter. During birthing, the organisms are shed in high numbers in the amniotic fluids and placenta.
Symptoms	Does not usually cause clinical disease in animals. In humans, symptoms of acute cases include high fever, severe headache, general malaise, myalgia, confusion, sore throat, chills, sweats, cough, nausea, vomiting, diarrhoea, abdominal pain and chest pain.
Prevention	Limit exposure to high risk excretions such as birthing by-products. Vaccination against Q Fever is available in Australia. At risk wildlife rehabilitators should be vaccinated against Q Fever if they are caring for macropods or involved with the rescue of macropods, especially trauma calls (where there is often a large amount of blood present).

Australian Bat Lyssavirus (ABLV)

Infectious Agent	*Lyssavirus*
Host	Bats (both megabats and microbat species)
Transmission	Transmission is through bites and scratches from infected animals or by being exposed to infected animals' saliva through the eyes, nose, mouth or broken skin. Any bat should be assumed to potentially be carrying ABLV and precautions taken.
Symptoms	In animals, symptoms can include undue aggression, neurological signs such as motor dysfunction, abnormal vocalisation, paraparesis and inability to fly. Though some animals may also present with very non-specific symptoms and a diagnosis is not possible based on symptoms alone.
Prevention	Vaccination against Australian Bat Lyssavirus. Avoid being bitten or scratched by any species of bat (use appropriate personal protective equipment).

Leptospirosis

Infectious Agent	*Leptospira spp.*
Host	A large range of wild animals including domestic species.
Transmission	Bacterial penetration of abraded or lacerated skin by infected urine, contaminated food, water, or soil, or by direct contact with an infected animal. Infection can also be through contact with the lining of the mouth, nose and eyes. The organism can invade intact skin.
Symptoms	In wild animals, the disease is usually unobvious except in marine mammals. The disease is relatively rare in humans. Human symptoms include fever, chills, nausea, malaise, and myalgia (muscle pain). In the severe state, it may induce kidney or liver disease and meningitis.
Prevention	Good hygiene, particularly avoiding contact with urine of wild species.

Psittacosos (Ornithosis, Chalmydiosis)

Infectious Agent	*Chlamydia psittaci*
Host	Mostly birds (over 100 species including pigeons, raptors, parrots, finches and poultry). Can be transmitted from human to human and from aborted material, abnormal equine placentas or symptomatic foals, though these infections are rare.
Transmission	Commonly through inhalation of contaminated dried discharges, droppings and feather dust from birds. The infecting organism is present in nasal discharge, droppings, feather dust and tissues of infected birds. The droppings are the most common route by which the disease is transmitted to humans. Transmission is also through mouth-to-beak transmission (i.e. kissing birds). It is commonly found in feral pigeons that appear healthy.
Symptoms	Signs in animals include diarrhoea, weakness, fluffed feathers, watery eyes and conjunctivitis and decreased or no appetite, resulting in emaciation and lethargy. Respiratory signs such as sneezing are also common. The disease may be acute and consequently the animal may die with few signs of disease. Clinical signs in people include fever, headache, upper respiratory infection, dry cough and pneumonitis. Rehabilitators, veterinarians, and bird banders have been infected by the birds they handle.
Prevention	Transmission is most commonly through the inhalation of aerosolized faecal and dust particles, so it is particularly important not to allow build-up of faeces in enclosed areas. When entering into a potentially infected area (for example, a pigeon roost), wear a mask to prevent inhalation of dust from the droppings. Also, practice good personal hygiene.

Salmonellosis

Infectious Agent	*Salmonella spp.*
Host	Birds, reptiles and most mammals.
Transmission	Through inadvertent ingestion of faecal matter on contaminated surfaces, eating utensils, hands, etc. Food, water, or eating surfaces may become contaminated. Gastroenteritis caused by *Salmonella spp.* is probably the most common zoonotic disease of humans. It is estimated there are two million cases annually in the United States. The organism is a commonly found commensal in the faeces of many animals, especially birds and reptiles.
Symptoms	Animals that develop Salmonellosis can exhibit diarrhoea, vomiting, dehydration, fever, general malaise, and death. Infections can sometimes be per-acute resulting in the sudden death of an animal before symptoms are evident. The bacteria are shed for some time following infection. Many animals are persistent carriers. In humans, the disease usually produces a gastroenteritis (intestinal infection) and fever accompanied by diarrhoea and often abdominal pain.
Prevention	Good personal hygiene.

Tetanus

Infectious Agent	*Clostridium tetani*
Host	Found in soil. Sometimes found in animal faeces.
Transmission	Infection is through contamination of small or large wounds or breaks in the skin with soil, dust and manure.
Symptoms	Tetanus is an acute disease caused by the toxins produced in the body by *Clostridium tetani* that affect the nervous system. The disease is characterized by tonic spasms of the muscle groups of the jaw, neck, and back. Left untreated, there is a 70 percent mortality rate.
Prevention	Vaccination of humans with a primary series of three doses of tetanus toxoid and booster every ten years is highly effective. Acute wound-associated tetanus can be prevented by appropriate wound management, including active or passive immunization Note: All wildlife rehabilitators should ensure that they have a current tetanus vaccination.

Giardiasis

Infectious Agent	*Giardia lamblia*
Host	Many species including birds and mammals.
Transmission	Faecal contamination of water and hand-to-mouth transfer of cysts from faeces of an infected animal. Wild mammals and birds can harbour these organisms. They presumably have acquired the disease from infected waters. Waterfowl and aquatic species of mammals are most frequently infected
Symptoms	A protozoal infection of the small bowel is often asymptomatic but may be associated with a variety of intestinal symptoms: chronic diarrhoea, abdominal cramps, bloating, weight loss.
Prevention	Avoid hand-to-mouth contact while handling any wildlife species. Good personal hygiene and hand washing

Toxoplasmosis

Infectious Agent	*Toxoplasma gondii*
Host	Most commonly the house cat; wild animals
Transmission	Ingestion of the oocyst (egg) from faecal contamination (especially after digging in soil or eating unwashed, uncooked garden produce); eating undercooked infected meat; transplacental infection in primary infections of pregnant women. Although wild animals are often cited as infectious agents for toxoplasmosis, the domestic house cat is the only species that passes infective eggs in its faeces. All other warm-blooded species may become infected but are not excreters of the infective egg stage. Other non-definitive hosts become infectious only when they are eaten by another animal.
Symptoms	The disease is seldom severe and usually is self-limiting. Acute disease may result in high fever, lymph node enlargement, muscle pain, and even death. A pregnant woman is particularly susceptible and when infected for the first time, often passes the parasite on to her baby. Up to 3,000 babies are born every year in the United States with ocular lesions produced from *Toxoplasma gondii*.
Prevention	Confining cats will prevent wild species contacting their faeces. Feral cat control will prevent contamination of soil through cat faeces. Make certain to practice good personal hygiene and sanitation.

Cryptococcosis

Infectious Agent	*Cryptococcosis neoformans*
Host	Birds and environment (esp. eucalyptus trees)
Transmission	Spread by inhalation. Generally, only a disease in immunocompromised patients. Healthy humans unlikely to become infected. Scant reports of zoonotic potential from wild birds to humans. Not transmitted directly from person to person.
Symptoms	Commonly causes meningitis but may also infect the lungs, kidneys, prostate and bone. Main symptoms are fever, tiredness and headache.
Prevention	Use high standard of hygiene when dealing with birds, particularly pigeon species. Wet down droppings before removing in order to reduce likelihood of inhaling the fungus.

For more information on zoonotic diseases that are animal borne, please refer to the Queensland Health website – www.health.qld.gov.au

Section 5

Veterinary Aspects of Wildlife Rehabilitation

Brown Tree Snake (venomous)
Credit: AZWH

The Law

The *Health (Drugs and Poisons) Regulation 1996* legislation outlines the classifications of drugs and poisons and the requirements on veterinarians when prescribing and administering controlled substances.

Schedule classifications for drugs and poisons

The Health (Drugs and Poisons) Regulation 1996

Schedule	Description
Schedule 1	(This schedule is intentionally blank)
Schedule 2 Pharmacy Medicine	Substances, the safe use of which may require advice from a pharmacist, and which should be available from a pharmacy or, where a pharmacy service is not available, from a licensed person. Only available from a pharmacy, veterinary surgery or licensed person
Schedule 3 Pharmacist Only Medicine	Substances, the safe use of which requires professional advice, but which should be available to the public from a pharmacist (or veterinarian) without a prescription. Only sold by authorised persons including veterinarians.
Schedule 4 Prescription Only Medicine/ Prescription Animal Remedy	Substances, the use or supply of which should be by or on the order of persons permitted by State or Territory legislation to prescribe and should be available from a pharmacist (or veterinarian) on prescription only.
Schedule 5 Caution	Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.
Schedule 6 Poison	Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label.
Schedule 7 Dangerous Poison	Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special regulations restricting their availability, possession, storage or use may apply.
Schedule 8 Controlled Drug	Substances which should be available for use but require restriction of manufacture, supply, distribution, possession and use to reduce abuse, misuse and physical or psychological dependence. Substances with legitimate therapeutic uses, but which have addictive or abuse potential.
Schedule 9 Prohibited Substance	Substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities. Generally, have no therapeutic use, and are subject to abuse. Only available for research.

The most common schedules of drugs used in the treatment of wildlife include:

Schedule 2 Pharmacy Medicine
Examples include paracetamol (Infant Panadol®) and Nilstat®. These medications should still be prescribed by a veterinarian who should provide an appropriate dose rate.

Schedule 4 Prescription Only Medicine/Prescription Animal Remedy
This includes antibiotics and analgesics (that only a veterinarian can prescribe)

Schedule 8 Controlled Drugs
This includes addictive drugs such as methadone, morphine etc (that only a veterinarian will administer).

When dealing with prescription medications for wildlife please note:

- Veterinarians can only prescribe a drug for an animal that they have examined. Do not ask a vet to prescribe a drug for animal they have not seen.
- All prescriptions should be clearly labelled by the vet when dispensing and should include:
    - The name of the drug
    - The amount to be administered (generally listed in mls)
    - The route of administration (e.g. orally, subcutaneous)
    - The frequency of administration (e.g. how many times per day)
    - The length of administration in days (including commencement and finish date)
    - The name/identification of the animal or the wildlife carer's name
    - Any other pertinent information relating to administration of the drug

Different Types of Drugs and their Uses

Analgesic	Relieves pain without affecting consciousness. Some may reduce level of alertness.
Antibiotic	Inhibits the growth of or kills bacteria
Sedative	Depresses the central nervous system and tends to cause reduced mental activity (also referred to as a tranquiliser)
General Anaesthetic	Produces unconsciousness. Can be either injectable or inhalation.
Local Anaesthetic	Produces localised analgesia of an area. Usually used for small, short procedures.
Anti-Inflammatories	Relieves pain, swelling and fever caused by acute inflammation.
Euthanasia Drugs	Drugs used to euthanise animals

Common Drugs used in Wildlife

Below is a schedule of drugs commonly used in Australian wildlife.

Antibiotics

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Betamox Amoxycillin 400 ®	4	Amoxycillin	Avian Mammal	Oral
Bactrim ® Septrin ®	4	Trimethoprim and Sulfamethoxazole	Avian Mammal Echidna Reptile	Oral
Trivetrin ®	4	Trimethoprim and Sulfamethoxazole	Mammal Reptile	Injection
Baytril ®	4	Enrofloxacin	Avian Reptile Amphibian Mammal Monotremes	Available in both oral or injectable forms
Clavulox ®	4	Clavulanic acid and Amoxycillin	Avian Mammal	Available in both oral and injectable forms
Fortum ®	4	Ceftazidine	Reptile Mammals Avian	Injectable

Anaesthetic / Sedatives

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Isoflurane	4	Isoflurane	All species	Gaseous inhalation
Alfaxan RTU CD ®	4	Alfaxalone	Mammals Reptiles	Injectable
Zoletil ®	4	Tiletamine and Zolazepam	Mammals	Injectable
Pamlin ®	4	Diazepam	Mammals	Injectable

Analgesics and Anti-Inflammatories

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Temgesic ®	8	Burpenorphine	Mammal Monotremes	Injectable
Torbugesic ®	8	Butorphanol	Avian Amphibian Reptile	Injectable
Methone ®	8	Methadone hydrochloride	Mammals Monotremes	Injectable
Panadol ®	2	Paracetamol	Mammals	Oral
Painstop (Daytime) ®	2	Paracetamol and Codeine	Mammals	Oral
Metacam ®	4	Meloxicam	Avian Amphibian Mammal Monotremes Reptile	Available in both oral and injectable forms
Rimadyl ®	4	Carprofen	Mammals Monotremes	Injectable
Solu-delta-cortef ®	4	Prednisolone sodium succinate	Mammals/ Koalas	Injectable

Anti-Fungal

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Nilstat ®	2	Nystatin	Avian Mammals	Oral
Amphotericin B	4	Amphotericin B	Mammals	Oral
Diflucan ®	4	Fluconazole	Mammals Birds Monotremes Reptiles	Oral or injectable
Daktarin ®	3	Miconazole nitrate	Mammals	Oral (oral gel) or topical (ointment)
Surolan ®	4	Miconazole nitrate, polymyxin B sulfate and prednisolone acetate	Mammals	Topical

Anti-Parasitic

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Avitrol Plus ®	5	Levamisole hydrochloride and Praziquantel	Avian	Oral
Baycox ®	5	Toltrazuril	Mammal Avian	Oral
Cydectin ®	5	Moxidectin	Avian Mammal	Available in both oral and injectable forms
Ivomec ®	5	Ivermectin	Reptiles (not turtles) Mammals	Available in both oral and injectable forms
Panacur ®	5	Fenbendazole	Reptiles Mammals	Oral

Anti-Psychotic

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Haloperidol ®	4	Haloperidol decanoate	Macropods	Injectable

Gastro-intestinal

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Prepulsid ®	4	Cisapride	Koalas Mammals	Oral
Peptosyl ®	2	Bismuth sub-salicylate	Mammals	Oral
Tympanol ®	2	Acid dairy, spirit polyvinyl, tincture of bitter wormwood.	Mammals	Oral
Scourban ®	4	Sulfadimidine, Sulfadiazine and others	Mammals	Oral

Storing Drugs

All prescription medications should be stored according to the manufacturer's recommendations. Check the packaging carefully to establish the storage temperature and the sensitivity of the compound to light and humidity.

Note:

- **Check the expiry date**. Do not use once expired, as the active components of the drug may be ineffective.
- **Check the shelf-life** of the medication. Once constituted, many oral antibiotics are only effective for a short period (7 to 14 days). It is good practice to write the date opened/constituted on the bottle to ensure you do not use the drug past its shelf-life. At the end of its shelf-life, ensure the medication is disposed of appropriately.
- Some medications need to be **stored in the refrigerator** - check the instructions on the packaging carefully.
- **Do not freeze** unused portions of medications (unless directed by your veterinarian), as freezing can destroy the drug or reduce its effectiveness.
- Some medications need to be **stored in a dark place**. Some come in a brown bottle – these drugs need to be stored away from light. Ensure they remain in the original bottle or alternatively place the bottle in a dark bag (such as a brown paper bag) or wrap something dark around the bottle to protect the medication from light.
- Veterinarians will usually dispense drugs in quantities sufficient for the course of treatment for your individual animal.

Veterinarians will usually only dispense a quantity sufficient for the course of treatment required. This means you may not be provided with the original packaging making it difficult to check the storage requirements. If you require any clarification with regards to storage, check with the vet.

Disposal of Drugs

Prescription medications can be disposed of by placing them in the RUM (Return of Unwanted Medicines) at your local pharmacy. These are then destroyed in a high temperature purpose-built furnace. Empty containers can be wrapped in paper and placed in a garbage bin.

Alternatively unused drugs can be returned to the veterinarian that prescribed the medication.

Terminology

Wildlife rehabilitators should become familiar with common veterinary abbreviations. Abbreviations are used in a variety of circumstances (e.g. discharge paperwork and copies of veterinary records).

Listed below are some common abbreviations used:

Administering Medications

Abbreviation	Meaning	Abbreviation	Meaning
SID	Once daily	**PO or p.o.**	Orally (per os)
BID	Twice daily	**IM or i/m**	Intramuscular
TID	Three times daily	**SC or SQ or s/c**	Subcutaneous
QID	Four times daily	**IV or i/v**	Intravenous
qd	Every day (same as SID)	**ml**	Milli-litre
q8h	Every 8 hours	**q12h**	Every 12 hours

Physical Examination, Physiology

Abbreviation	Meaning
BAR	Bright, alert, responsive
BPM	Beats or breathes per minute
CRT	Capillary refill time
DOA	Dead on arrival
GI	Gastrointestinal
HBC or MVA	Hit by car / motor vehicle accident
HR	Heart rate
ICU	Intensive care unit
L (with a circle around it)	Left
R (with a circle around it)	Right
LOC	Level of consciousness
MM	Mucous membrane
NAD	No abnormalities detected
P	Pulse
PM	Post-mortem; or abbreviation for evening
R	Respirations
RR	Respiration rate
Stat	Immediately (statim)
TLC	Tender loving care
TPR	Temperature, pulse and respiration
URI	Upper respiratory infection
URT	Upper respiratory tract
WNL	Within normal limits
Wt	Weight
BW	Body weight

Abbreviation	Meaning
↑	Increased
↓	Decreased
+	Positive (used to describe test results) may have multiple +'s to indicate degree
-	Negative (used to describe test results) may have multiple –'s to indicate degree
<	Less than
>	Greater than
♂	Male
♀	Female
Bx	Biopsy
Dx	Diagnosis
Fx	Fracture
Hx	History
Rx	Prescription
Sx	Surgery
Tx	Treatment

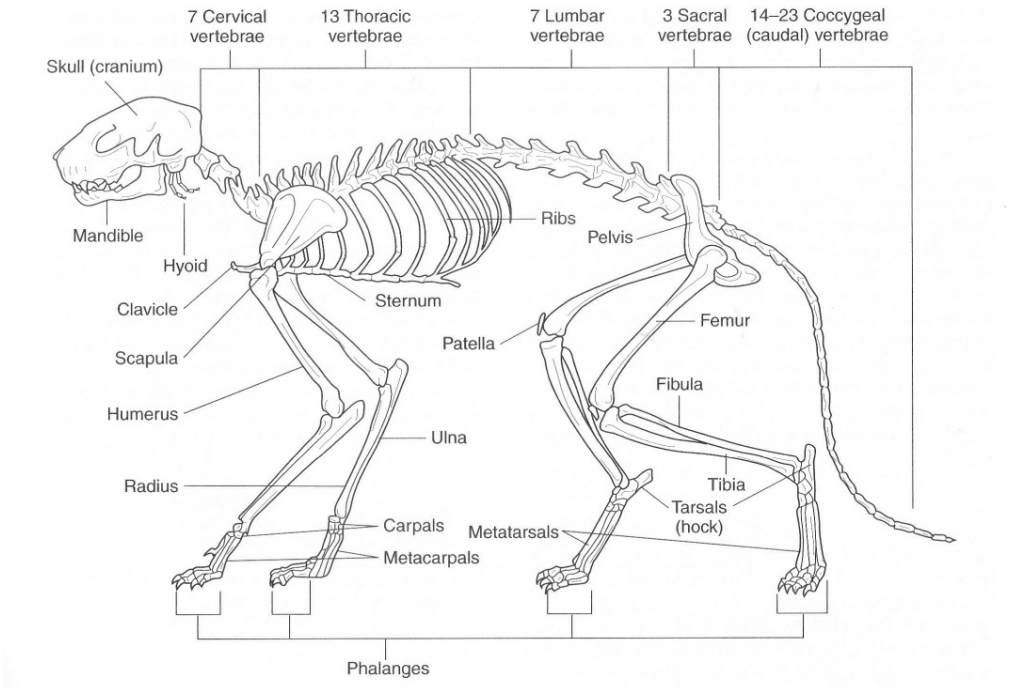


Diagram above indicates the skeletal structure of a cat which is very similar to many wildlife species. Rehabilitators should become familiar with basic anatomical definitions.

Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)

Terms Used to Describe Direction

It is useful for wildlife rehabilitators to have an understanding of some of the commonly used terms used by veterinarians when describing direction on a body. This helps you understand veterinary notes describing injuries and wounds. Below is a list of commonly used terms and what they relate to.

Abbreviation	Meaning
Ventral	Refers to the belly or underside of a body or body part
Dorsal	Refers to the back
Cranial	Means towards the head
Caudal	Means towards the tail
Anterior	Means front of the body. Used more to describe organs or body parts.
Posterior	Means rear of the body
Rostral	Means nose end of the head
Caudal	Means towards the tail
Cephalic	Means pertaining to the head
Medial	Means toward midline
Lateral	Means away from the midline
Superior	Means uppermost, above, or toward the head
Inferior	Means lowermost, below, or toward the tail
Proximal	Means nearest midline or beginning of a structure
Distal	Means farthest from midline or beginning of a structure
Superficial	Means near the surface; also called external
Deep	Means away from the surface; also called internal
Palmar	Means bottom of the front foot or hoof
Plantar	Means bottom of the rear foot or hoof.

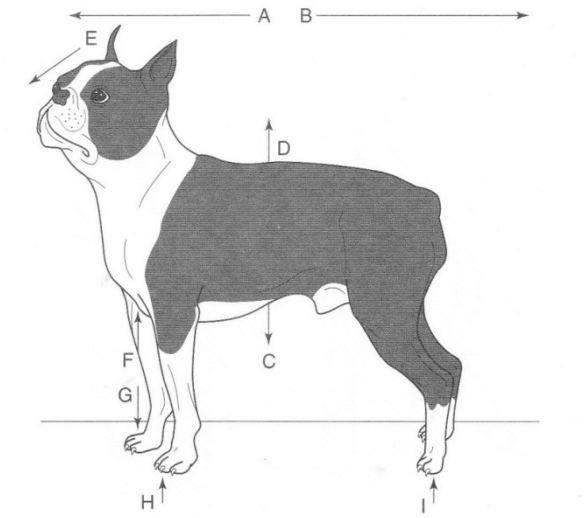


FIGURE 2–1 Directional terms. The arrows on this Boston terrier represent the following directional terms: A = cranial, B = caudal, C = ventral, D = dorsal, E = rostral, F = proximal, G = distal, H = palmar, I = plantar.

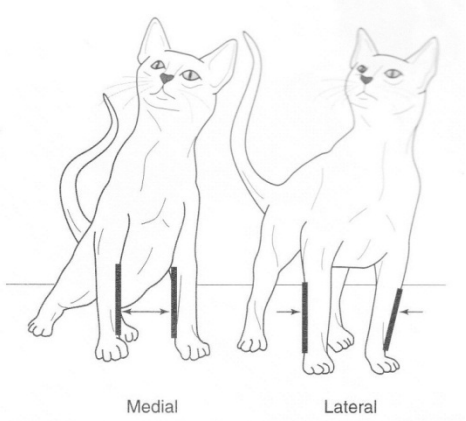


FIGURE 2–2 Medial versus lateral. The arrows on these cat represent the directional terms medial and lateral.

Source: *All Illustrated Guide to Veterinary Medical Terminology*

Basic Calculation of Drug Doses

Your vet will advise the correct dosage of drugs to be administered when they prescribe medications for your animal. However, it is important that wildlife rehabilitators understand how to calculate basic drug dosages and correctly measure medications to ensure the animal receives the prescribed amount.

To calculate the amount you need to administer, you must have a current and accurate weight of the animal. If the animal is to remain on the medication for a period of time, you must weigh the animal regularly so the dose can be adjusted accordingly.

Very basic drug dose volumes are commonly referred to as "***x* mls per kg**" – for example, 2mls of medication per kilogram of body weight.

For example, if the dose rate is "2mls/kg" then:

- An animal weighing 3.2kgs would require 6.4mls of medication
- An animal weighing 1.5kgs would require 3mls of medication
- An animal weighing 400g would require 0.8mls of medication

When calculating doses for animals less than one kilogram, ensure the weight is converted to kilograms and not grams. For example, the 300g magpie would be calculated as 0.3kg.

Note – veterinarians use a more complicated formula to work out the drug dose volume of medications they prescribe, as they need to account for the concentration of the medications being prescribed. Veterinary drug dosages are often identified as 'x' mg/kg. The symbol 'mg' should not be mistaken for 'ml'. These mean different things.

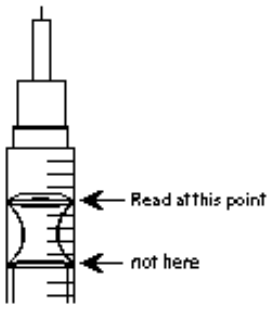
Proper Use of Needles and Syringes

Some important points to remember:

- Use the syringe volume that is closest to the volume of medicine to be delivered for the greatest accuracy. For example, do not use a 20ml syringe to draw up 2mls of medication. The best choice for 2mls of medication would be a 2.5ml or 3ml syringe. The best choice for 0.5mls of medication would be a 1ml syringe.

- Ensure there are no air bubbles in the syringe. You can remove air-bubbles by holding the syringe upright and tapping the barrel of the syringe. The air bubbles will move to the top of the syringe making it easier to expel the bubbles by slowing pushing the plunger.

- When reading a syringe, remember to measure from the top of the plunger not the bottom.



- Disposable syringes are sterilized, pre-packaged, non-toxic and ready for use.

- When administering oral medications - ensure you use a clean syringe. Use either a new sterilized pre-packaged syringe or alternatively, you can re-use syringes provided they are disinfected by either soaking in F10® disinfectant or by steam sterilizing in the microwave. Do not re-use syringes for injections.

- When administering medications by injection, only new pre-packaged syringes and needles should be used.

- Selection of needle size is based on the amount and viscosity of the medication. Thick, oily medications require needles with large lumens; thinner medications are given through needles with smaller lumens.

- Needle size is inversely proportional to its number. For example, a 16 gauge needle has a large lumen than a 25 gauge needle.

- Needle size selection is also based on the route of administration. Intramuscular injections are given with small-lumen needles (e.g. 25 gauge) and subcutaneous injections in large animals are given with large-lumen needles (e.g. 21 or 23 gauge).

- Needle size selection is also based on the species and age of the animal. Use a smaller gauge for young animals and a larger gauge for older, larger animals.

- Needle length is based on the route of administration. To give a deep muscle injection, a needle of appropriate length must be used bearing in mind the depth of the muscle and the overall size of the animal. Most needles used in common species of wildlife range in length from 0.5" to 1".

- Disposable syringes come in the following sizes (depending upon the brand):

    - 0.3mls (commonly referred to as an Insulin syringe)
    - 0.5mls (commonly referred to as Insulin syringe)
    - 1ml
    - 2.5mls (or 3mls)
    - 5mls
    - 10mls
    - 20mls (or 25mls)
    - 50mls

- Some syringes come with needles already affixed – most commonly Insulin syringes.

- Syringes come in both 'slip lock' (below left) or 'luer lock' (below right) variations. Luer lock syringes are good for animals that are difficult to restrain (e.g. adult macropods) and when using crop needles as the needle is 'screwed' onto the tip preventing it from slipping off.

Source: Extracted from *Fundamentals of Pharmacology for Veterinary Technicians* (Romic, JA).

Common needle sizes used in wildlife

Birds

Most species – 30g, 27g or 25g (1/2" length maximum)
Large species (large waterbirds) – 23g (1" length maximum)

Reptiles

Small to medium species – 27g or 25g
Large species – 23g

Mammals

Small Mammals – 27g or 25g (1/2" or ¾" length)
Large Mammals – 23g or 21g (3/4" or 1" length)

Easy Reference Chart

Many of these tables and diagrams have been reproduced as an Easy Reference Chart in the Species Information Sheets to make them easier to access.

Drug Routes of Administration

There are several methods of administering medications. Each route has advantages and disadvantages. The route selected will depend on a number of things including:

- The **state of the animal** (whether the animal is in a critical state and may require administration by a route that will enable the drug to be absorbed faster – i.e. intravenous).
- The **temperament** of the animal. Some animals may be more difficult to administer injections to but may willingly take medications mixed into their food.
- Any **unique species characteristics** (e.g. oral medications can affect the gut-flora of some native species such as koalas and ringtail possums).
- The **formulation of the drug** (e.g. some drugs may only come in oral or injectable form).
- The **experience and knowledge** of the person administering the drug (a less experienced rehabilitator may be provided with oral medications as opposed to injectable medications).

All drugs must be administered in a specific manner. If a vet prescribes a medication and you are unsure how it is to be administered – always check before administering. For example - Baytril® (antibiotic) comes in several forms – an oral form and an injectable form. Administering the oral form by injection will have adverse effects (and vice versa).

The general methods of administering medications are outlined below.

Oral

The medication is placed into the animal's mouth and it is allowed to swallow. Oral medications include tablets and liquid mixtures. Tablets are not often prescribed for wildlife and if they are, they are always crushed and placed in a liquid suspension or placed in food.

Topical

The preparation is applied directly to the site where the drug is required. Topical medications include creams, ointments, lotions, medicated shampoos and aerosol sprays.

Inhalation

The medication is absorbed through the animal's respiratory system, generally through the use of a nebuliser (e.g. antibiotics for treatment of pneumonia).

Parenteral

Refers to routes by which drugs are injected into the body of animal and can include:

- **Intramuscular** – Into the muscular tissue
- **Intravenous** – Directly into venous blood
- **Subcutaneous** – Into the tissue between the skin and muscle layers (under the skin).

The most common routes of administration that wildlife rehabilitators use will be either oral or topical. More experienced rehabilitators may be provided with injectable medications but only if they have been properly trained to give injections and are confident in their handling/restraint of that species.

If a vet prescribes an injectable medication for an animal, and you are unsure or have not been trained to do so, please ask the vet to demonstrate the correct method of administration or alternatively ask the vet if there is an oral medication that would be suitable. If you are not

confident to handle the animal to give injections, then it will be more appropriate for the animal to be placed with a more experienced rehabilitator while the animal is on that course of injectable medications. Alternatively, the animal may need to stay in a wildlife hospital during the course of its medication.

Please also note that different species have different preferred injection sites. You should ensure that you are familiar with those sites on the species that you are caring for. Refer to the Species Information Sheets.

Oral Administration

Oral administration of medications is the most common form of administration that wildlife rehabilitators will use. However, it is now more commonly understood that oral medications (particularly antibiotics) can have a detrimental effect on the gut-flora of some mammal species, and for this reason there is now a tendency to use injectable antibiotics, particularly in species such as koalas and ringtail possums.

Oral medications for native wildlife are usually in the form of liquid. In some instances, tablets may be prescribed, but these are crushed and mixed with food or liquid for easier administration.

Liquid medications are easily administered using a syringe.

Procedure for Oral Administration

1. Draw up the required volume of drugs in a clean syringe. Double check that the amount matches the label or discharge paperwork provided by the vet.

2. The patient should be suitably restrained.

3. Ensure that the animal's head is kept at a neutral angle and not elevated, so that the fluids do not enter the trachea.

4. For mammals, gently push the syringe into the side of the animal's mouth. This is generally between the front incisors and the molars where there is a gap.

5. For birds, insert the syringe into the side of the mouth and SLOWLY dispense a small amount of medication at a time.

6. Inject the fluid into the mouth slowly. For an adult mammal, if giving more than 0.5mls, allow the animal a few seconds to swallow the medication before dispensing more.

7. If the animal coughs or if the liquid spills from the animal's mouth, allow it to rest for a moment before attempting to re-administer.

When administering tablets, pulverize the table into a small volume of food, water or flavoured liquid. Do not use a large volume of food/liquid as you need to ensure the animal consumes the entire dose. It may be more effective to withhold food to the animal until the medication is administered. Do not sprinkle the tablet onto the animal's daily food requirement as it may not eat the entire meal and therefore will not get the full dose.

Administering oral medication to an adult koala.

Credit: AZWH

Not all wildlife patients are this keen to have their medication!

Credit: AZWH

Topical Administration

This route of administration refers to medications that are applied directly onto an affected area. They include medications used to treat ocular (eye) diseases and those used to treat skin conditions and wounds.

Procedure for Ophthalmic Administration

1. For placement of medication onto the surface of the eye, good restraint is essential otherwise the medication will be inadvertently placed on the eyelids or face.

2. The tip of the medication dispenser should never come into contact with any surface, including the cornea, because it may become contaminated or scratch the cornea.

3. Eye medication should be used exclusively for the patient for whom it is prescribed. Sharing ophthalmic medications may transmit ocular infections between animals.

4. Warm the ointment or drops by holding it in your hands for 1-2 minutes (if it has been refrigerated).

5. Hold the eyelids open with the thumb and index finger of one hand as one drop of medication is deposited onto the eye surface. It is helpful to rest the hand holding the medication on the animal's head as the drops are dispensed.

6. When administering ointments, the lids are held open as aforesaid, and a 5mm strip of ointment is squeezed onto the upper or lower eyelid. The ointment is then dispersed across the cornea when the animal blinks. An alternative option is the dispense a small amount of ointment onto a cotton bud/tip and then gently wipe on to the lower eyelid (avoid touching the surface of the eye)

Procedure for Other Topical Administration (Ointments, creams etc).

1. Ensure that the animal is suitably restrained.

2. The tip of the medication dispenser should never come into contact with the affected area as it will become contaminated.

3. Using disposable gloves, squeeze the required amount of medication onto a gloved finger and then use that finger to spread the medication on the affected area.

4. For smaller, or hard to reach areas, squeeze the medication onto a cotton bud and use that to apply the medication onto the affected area.

Distributing topical medication. Surolan® was distributed evenly over the affected area by placing a small amount of ointment on a gloved finger and then spreading with the finger.

Credit: Karen Scott

Subcutaneous Administration

Subcutaneous injections are frequently given to wildlife as they are relatively easy for experienced wildlife rehabilitators to administer and generally allow for rapid absorption of the medication. Subcutaneous injections, however, are generally not recommended in severely dehydrated or critically ill patients where absorption may be compromised.

The preferred site for administering subcutaneous injections on various species is listed in the Species Information Sheets.

Procedure for Subcutaneous Injection

1. Select a sterile needle and syringe appropriate to the amount and velocity of the medication being administered
2. If drawing up the medication from a bottle or bag, swab the port with an alcohol swab before inserting the needle. Give the alcohol a few seconds to dry.
3. Draw up the required volume of drug.
4. Ensure that the patient is suitably restrained.
5. Raise a fold of skin from a suitable area.
6. Moisten the skin with an alcohol swab to flatten the hair and remove surface dirt.
7. Insert the needle under the skin horizontal to the body and drawback the syringe plunger slightly. If blood appears in the syringe or needle hub, a blood vessel has been punctured - remove the needle and attempt in another location.
8. If no blood appears, the drug may be injected into the patient slowly.
9. Massage the injection site gently to disperse the drug (if the animal allows).
10. Immediately dispose of needle and syringe in an appropriate Sharps container.
11. Make a record of the medication administered in your progress chart.

The loose skin from the back of the neck to the rump is the most common site for the administration of subcutaneous injections. This area is suitable because of its poor supply of nerves and large blood vessels.

If giving subcutaneous injections regularly (once or twice a day) take a note of where the injection is administered so that you do not repeatedly use the same site.

Subcutaneous injection – tent a section of skin, wipe with alcohol swab and insert the needle into the fold of skin being careful to avoid any muscle or nerves.

Credit: Karen Scott

Intramuscular Administration

The intramuscular route is used for injection of small amounts of medication.

Procedure for Intramuscular Injection

1. Select a sterile needle and syringe appropriate to the amount and velocity of the medication being administered.
2. If drawing up from a bottle, swab the top of the bottle with an alcohol swab before inserting the needle. Allow the alcohol to dry for a few seconds.
3. Draw up the required volume of drug.
4. Ensure that the patient is suitably restrained.
5. Isolate the muscle between your fingers and thumb (Photo 1).
6. Moisten the skin with an alcohol swab to flatten the hair and remove surface dirt.
7. Using an appropriate gauge needle, embed the needle into the muscle at a 90-degree angle to the skin (Photo 2).
8. Retract the syringe plunger slightly, if no blood appears, the drug may be injected into the patient SLOWLY (Photo 3). If blood appears, remove the needle and attempt in another location.
9. Massage the injection site gently to disperse the drug (Photo 4) (if the animal allows).
10. Immediately dispose of needle and syringe in an appropriate Sharps container.
11. Make a record of the medication given in your progress chart.

Only small amounts of fluid should be administered by this route as large amounts can be painful.

Intramuscular injections in birds are generally given in the muscle over the keel bone.

In mammals, intramuscular injections are generally given in the thigh area. Be careful when giving injections in the thigh/hip area as the sciatic nerve runs through this region and hitting the nerve can cause severe pain and even lameness or paralysis.

The preferred site for administering intramuscular injections on various species is listed in the Species Information Sheets.

1 – Isolate the muscle and then wipe the area with an alcohol swab

2 – Embed the needle at a 90° angle

3 – Draw back on the plunger. If no sign of blood, slowly inject.

4 – Massage the injection site

The Vet Visit

When caring for sick, injured and orphaned wildlife, veterinarians play an essential role in the successful outcome of that animal.

In South-east Queensland, we are very fortunate to have the support of many local veterinarians who treat sick and injured wildlife.

Most veterinarians donate their time free of charge to see wildlife and do not expect wildlife rehabilitators to pay consultation fees. Many veterinarians do however charge a nominal or reduced charge for the costs of medications and some procedures such as pathology tests and radiographs.

The following is extracted from the paper 'The Vet Visit' by Dr. Jonathan Hanger and Dr. Andrew Tribe.

What should Vets expect from wildlife rehabilitators?

- Respect
- Appreciation – giving of time and experience at no charge
- Recovery of out-of-pocket expenses
- Medications
- Pathology expenses
- High standard of care from rehabilitators
- Advising outcome of animal and providing feedback
- Gifts of alcohol and chocolate!

What should wildlife rehabilitators expect from vets?

- Compassion
- Being honest about their willingness to treat wildlife
- Being honest about their ability and knowledge
- Prompt treatment of trauma victims (including euthanasia if appropriate)
- Acknowledgment and respect for rehabilitators knowledge and experience
- Diagnostic tests where necessary (e.g. faecal tests, blood tests, radiographs)
- Treatment Plan – giving clear and concise instructions
- Being charged cost price for services and medications

Preparing for the Vet Visit

Please consider the following points when making arrangements to take native animals to a vet:

- Always ring and make an appointment – do not turn up unannounced. If you have just rescued a critical animal and require immediate veterinary assistance, ring the veterinary clinic on your way to let them know you are coming and provide details of the animal including the species and its injuries/condition and confirm they are prepared, and have the resources to assess and treat the animal.

- For non-critical animals, contact the vet clinic and arrange an appointment. The staff will need to know the species and what is wrong with it.

- Arrive at least 5 minutes before your appointment. If your animal is not critical, you may be expected to wait for the veterinarian if they are busy, if previous appointments are running over-schedule or if an emergency arises.

- Take the animal in a suitable carry container and ensure it is fully covered so that exposure to domestic animals is limited. If the animal is particularly stressed, ask the reception staff if the animal could be placed in a quiet room until the vet is available.

- It is preferable not to leave a native animal or bird at a veterinary surgery for treatment, but in some instances, it may be necessary, particularly if the vet is busy and they are not sure when they will be able to see to the animal.

- If the animal is new into care, ensure you have conducted a thorough assessment of the animal before taking it to the vet. This may not always be feasible with critically injured animals or animals requiring euthanasia but being prepared and having conducted an assessment yourself will often save the vet time.

- If you think you will need the vet to conduct a faecal test, ensure a fresh, uncontaminated sample is provided.

- Weigh your animal the day before or morning of your appointment (where possible). The vet will need a current and accurate weight to calculate drug doses if required.

- Take the animal's veterinary records and progress chart with you. This is particularly important if the animal has received previous veterinary treatment. Ensure that you are familiar with the animal's history.

- If you think that the animal will need to be anaesthetised, do not feed or water the animal for at least 2 hours beforehand, to prevent it from regurgitating under anaesthetic.

- Remember to always thank the vet and support staff for their assistance.

Common Diagnostic Aids

Often a clinical examination of an animal alone is not sufficient for a vet to make an accurate diagnosis and they may need to rely on certain diagnostic tests to confirm their diagnosis.

Some of the more common diagnostic tests are explained below.

Faecal Tests

There are 2 common types of faecal tests that a vet can conduct, one being a "faecal smear" and the other being a "faecal float". Both are used to diagnose different parasites, diseases and infections. Faecal tests are one of the more common diagnostic tests are performed on wildlife. They are used to diagnose conditions such as bacterial infections, Candida and internal parasites.

Experienced veterinary nurses are also often able to perform these tests.

Blood Tests

This will involve the vet drawing blood from a vein of the animal. Common tests include PCV (packed cell volume), protein content and blood smears. Blood tests are used to diagnose conditions such as anaemia, bacterial infections and leukaemia and to check dehydration levels on critically sick/injured wildlife. They are also used in some cases to check the level of function of organs such as the kidney and liver.

Ultrasound

Ultrasound is the imaging of internal body structures and is most effective for viewing solid organs or soft tissue. This is often used to diagnose conditions such as ovarian cysts in koalas.

Radiograph (X-ray)

A radiograph is used to visualize internal body structures including bones, air and soft tissue. The most common use of radiographs is to diagnose fractures, but can also be used to diagnose conditions such as pneumonia and obstructions in the gastrointestinal tract.

Radiograph (xray) of bird.
Note the obvious fracture to the right leg.

Source: AZWH

Collecting Samples

Urine

Ideally, urine should be collected in a sterile container by holding it underneath the animal while it is urinating. With wildlife, this is usually not possible! If the animal urinates on a clean floor surface (such as tiles) use a sterile syringe to draw up a quantity of the urine. Otherwise, the vet will obtain a urine sample by manual expression of the bladder or cystocentesis (by inserting a very fine needle into the bladder through the abdominal wall whilst the animal is anaesthetised).

Faeces

Collect a faecal sample into a wide-mouth sterile container. Ensure that the sample is fresh. For accurate results, the test should be undertaken within 24 hours of collection.

For urine and faecal samples, clearly mark the container with the animal's name and the date the sample was collected. Place the container in the refrigerator.

Other Samples

Your vet may require other samples such as blood, abdominal fluid, feathers or skin scrapings. Your vet will collect these samples as some are required to be collected under anaesthetic.

Specimen containers used to collect samples.

Source: Grale Scientific

Utilising Emergency Veterinary Clinics

In South-east Queensland we are fortunate that there are a number of 24-hour veterinary clinics that will accept wildlife free of charge and provide emergency assessment and treatment. In addition to the points listed above, please take note of the following when seeking assistance from emergency clinics:

- If arriving with a critically injured animal, ring ahead and check that veterinary staff are available to see the animal. Always identify yourself to the veterinary staff as a wildlife carer (local veterinary clinics are aware that wildlife carers are volunteers). Please remember, that emergency clinics are often very busy dealing with domestic animal emergencies. The veterinary staff will prioritise (triage) animals according to their injuries, however paying patients of the clinic will generally receive priority over non-paying wildlife patients.

- If the clinic is busy and the animal requires euthanasia, offer to assist by restraining the animal while veterinary staff administer the euthanasia solution (if you are confident with restraint/handling of that particular species). This assistance is often appreciated by busy veterinary staff some of which may not be overly confident with handling that particular species.

- Emergency clinics will not generally charge to euthanise critically injured wildlife. If they wish to carry out any procedures or administer any medication, they will generally advise you beforehand if it is their intention to charge a fee for doing so. Generally, most emergency clinics will provide emergency treatment free of charge (such as administration of analgesics, antibiotics or euthanasia solution).

- Although it is preferred that wildlife are not left at veterinary clinics, in some instances it may be necessary to leave the animal at the clinic. Examples where it is more appropriate for wildlife to be left at emergency clinics include:

    - Where the animal is prescribed S8 drugs (e.g. Methone®, Temgesic®). These medications need to be administered at more regular intervals (some as frequently as every 4 hours). Vets will not provide S8 drugs to wildlife carers to administer at home. These drugs generally reduce the animal's level of alertness which helps to reduce stress.

    - Where the animal needs to be on intravenous fluids. Very few wildlife carers have the equipment or training to confidently monitor IV fluid administration.

    - Where the animal is in respiratory distress. These animals can deteriorate quickly and may need to be intubated (a tube placed in their trachea to help them breathe) or they may require oxygen therapy or even euthanasia.

    - Where the animal is suffering from seizures/convulsions. These animals are likely to need to be sedated.

Below are some ways that can help to reduce stress on wildlife that are left in veterinary clinics:

- Ask the veterinary staff if they are able to place the animal in a separate area away from domestic animals to help reduce stress. Many vet clinics have an area specifically set aside for wildlife.

- Politely remind the veterinary staff of the animal's history. For example, an animal that has been attacked by a domestic dog will suffer tremendously from stress if housed in close proximity to dogs in a clinic environment.

- Leave the animal in a suitable container/carrier. Most veterinary clinics do not have smaller enclosures suitable for wildlife and will be placed in their standard hospital cages. Leaving the animal in a more suitable container can help reduce stress and can assist in placing the animal in a quieter environment (e.g. a separate room). This can also help reduce stress as the bedding/linen in your rescue carrier should not smell like domestic animals. If leaving the animal in your carrier, make sure it is clearly marked with your name and contact number.

- Leave the animal with some natural cover or food. For animals such as possums or koalas, provide them with some natural vegetation to eat. Even if they are not interested in food, providing a small amount of browse can help reduce stress. Do not provide browse if the animal has sustained head or mouth injuries.

Specialised Wildlife Hospitals

As a wildlife rescuer or carer, you should become familiar with the wildlife hospitals in your area. In South-east Queensland we are fortunate to have a number of facilities including Currumbin Wildlife Hospital, Australia Zoo Wildlife Hospital and the RSPCA Wildlife Hospital.

A number of parks and zoos also provide veterinary assistance to licensed wildlife rehabilitators.

These facilities accept wildlife from the general public and from wildlife rescuers. They provide invaluable veterinary treatment free of charge to wildlife and provide additional services such as radiographs, blood tests and faecal tests. These facilities also provide prescribed medications free of charge to registered wildlife rehabilitators. The level of support provided by these facilities to our local wildlife and rehabilitators is invaluable and we encourage wildlife rehabilitators to support these facilities wherever possible as all are not-for-profit organisations relying on the support of the general community, just as wildlife care groups do.

When utilising the services of a wildlife hospital, please bear the following in mind:

- Make an appointment to take non-critical animals for veterinary treatment. Most facilities have set times for carer appointments.

- If you are taking a critical animal, telephone on your way and advise your ETA, the species and its condition. This helps them prepare for the animals' arrival.

- For new admissions, most facilities prefer the animal is admitted and left at the hospital. New admissions are then triaged and seen according to the severity of their injuries.

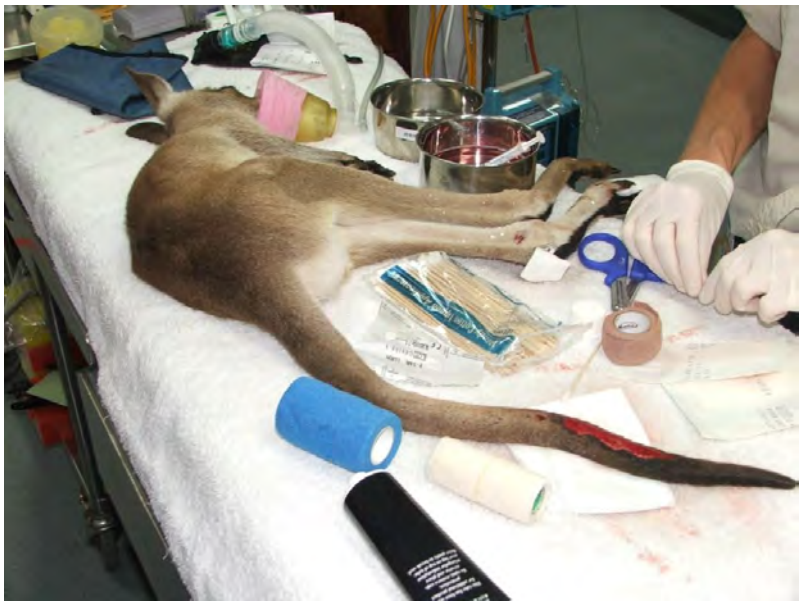
- Be respectful of any health and safety procedures that the facility may have in place. For example, some facilities do not allow bats to be handled by rescuers in the hospital; they must only be handled by hospital staff.

- When leaving animals at facilities, ensure all your carriers and equipment are clearly labelled with your full name and your telephone number. These facilities admit a large number of animals and it is often difficult for them to keep track of which equipment belongs to which person.

- Ensure that you have available the animal's details including:

    - Date and time of rescue
    - Reason for rescue
    - Contact name and number of caller
    - Exact rescue location
    - The length of time the animal has been in care
    - Any medications administered by either yourself or another veterinarian
    - Any food/water which has been provided to the animal (this may influence whether the animal can be anaesthetised).
    - Full history of the animal (if it has been in care for a length of time) including your progress charts if appropriate.

Remember that wildlife hospitals rely on keeping accurate data from wildlife admissions to assist in funding applications and to provide essential data to government organisations.



Above: Eastern Grey Kangaroo joey being treated at Australia Zoo Wildlife Hospital.

Credit: AZWH

Section 6

Home Care of Sick and Injured Wildlife

Orphaned koala joey.

Credit: Lee Pirini

Introduction

The prognosis for any sick or injured native animal will be greatly influenced by the quality of care that you provide to the animal on a day-to-day basis during its course of rehabilitation.

Listed below are procedures that should be adopted to ensure the best possible outcome for the animals in your care.

Housing

Provide Security

- Most mammals and reptile species will feel more secure if provided with a "hidey-hole". For small mammals (small possums, gliders, native rodents, bandicoots) and reptiles (dragons, skinks) this can be a simple cardboard box with the top removed and turned upside down with an appropriately sized hole cut in one end. Small clean hollow logs, or PVC plumbing pipe can also be used, but they must allow you to access the animal if required. For larger species such as Brushtail possums, provide a possum nest box (ensure that the possum box has easy access for treatment such as a hinged front door or lid).

- Provide natural vegetation. Even if the animal is not self-feeding, (or if they are not herbivores), the provision of some small leafy branches, or leaf litter (if injuries allow) in the enclosure so that they have something to hide in, will provide them with security. This is important for all species at all stages of their rehabilitation.

Common Brushtail Possum in a timber possum box
Credit: Karen Scott

Infant koalas with their 'teddy' which provides them with a sense of security.
Credit: Karen Scott

Provide Warmth

- Most sick and injured wildlife will require some form of gentle warmth to aid in healing. For animals that are mobile, providing a gentle heat source to one side, or at one end of the enclosure will allow them to move towards or away from the heat as they need. For animals which are not mobile (e.g. paralysed), you will need to closely monitor the animal for signs of over or under heating. Always use an indoor/outdoor probe thermometer (pictured right) when providing heat and ensure that you have good knowledge of the correct temperature range for that species.

- Heat sources may include electric heat pads, hot water bottles, hospital lamps, Snugglesafe® heat disks, humidicrib or intensive care units (Vetario, Brinsea or R-COM) or brooder box.

- A digital indoor/outdoor probe thermometer is an essential item to monitor the ambient temperature of the enclosure. Be careful not to place it within reach of an animal that may chew it. If given the chance, some animals may chew probes and cords, so to prevent this you can cover them in a small width of PVC conduit pipe with the probe slightly exposed at one end. This will help protect the cord whilst still recording an accurate temperature.

- Ensure you know the preferred body temperature of the animal that you are caring for. This varies greatly between species and even within individual animals within a species.

- Ensure that the method of heating that you use does not pose a risk to the animal. For example, if using a heat lamp ensure that the animal (such as gliders, reptiles, birds) cannot reach the lamp and sustain burns. Using a 'cage' over the lamp helps to reduce the risk of injury.

You must be aware of the PREFERRED BODY TEMPERATURE of the species you are caring for. Please refer to the Species Information Sheets for specific information on providing heat to various species.

You must pay close attention to the behaviour of the animal in your care to ensure it is not suffering from heat stress. Remember, as the animal improves and is able to maintain its own body temperate, you will need to adjust its heating requirements.

Young ducks in a hospital cage with a desk lamp for gentle warmth.
Credit: AZWH

Intensive Care Unit which provides warmth and humidity for sick and orphaned wildlife.
Credit: Karen Scott

Cage Setup and Placement

- Ensure that cages and enclosures are placed in a suitable area.
- Outdoor enclosures must be housed away from domestic animals (both yours and your neighbours) and as far away as possible from noise (don't put the enclosure outside the family room near a loud TV or stereo).
- Indoor enclosures should be placed in a quiet room or garage where there will be minimal disturbance to the animal.
- Enclosures should provide protection from the elements such as draughts, rain, full sun or inclement weather (such as hail or storms).
- For social species (e.g. bats and some bird species) place enclosures in the vicinity of others of their own kind. For species such as bats, which live in large colonies, this greatly reduces stress on the animal. Ensure you take into consideration any quarantine requirements before placing them too close.
- Do not place territorial or prey species within site or smell of each other. For example, small mammals in close proximity to reptiles or large predatory birds close to small prey birds.
- Enclosures should allow you to easily access the animal. For example, do not place a large bird in a cage with only a small opening as it will be difficult to access the bird.

Bedding

- Ensure that bedding is soft, clean and appropriate to the size and condition of the animal.
- Ensure that general bedding is changed daily or more regularly if required.
- Soiled or wet bedding should be changed as regularly as possible.
- Contaminated or stained bedding should be soaked in a sanitising solution before washing (such as Napisan).
- Absorbent products such as bed protectors or puppy pads (these have a plastic bottom and absorbent padding on the top) can be used as these help to draw moisture away from the animal but still need to be changed regularly.

Infant koala suffering from Chlamydia and pneumonia. His basket is well padded with warm blankets and he has a teddy for security. He has fresh leaf within easy reach.

Credit: Karen Scott

Open Wounds

- Do not house animals in dirt or leaf litter substrate as the wound may become infected or contaminated with debris. House the animal in an enclosure that is easy to clean (such as a plastic tub or carry cage) and provide clean towels or newspaper on the floor of the enclosure.

- House indoors – housing indoors greatly reduces the risk of the wound becoming fly-blown (infested with maggots). Covering the indoor enclosure with flyscreen mesh also greatly reduces the chance of flystrike. It is important during the recovery phase that the animal has some gentle sun exposure each day (or every second day) for at least twenty minutes. Cover the wound if possible or check thoroughly once you have brought them back inside for any sign of contamination.

Fractures

- For mammals with fractured limbs which normally climb, such as possums or gliders, obtain clear instructions from the veterinarian before putting climbing branches in their enclosure. Most fracture repairs should enable the animal to resume normal movement straight away; however, some will need resting for a period of time before normal movement is allowed. In order for these fractures to heal properly you must ensure that the animal does not use the affected limbs unnecessarily.

- For birds with fractures, house in a cage or enclosure with towels on the bottom. If providing a perch, ensure that the perch is low in the enclosure, so if the bird falls it is less likely to injure itself further.

- For birds with sore feet, cover the perches with soft towels or foam to provide support and to reduce further injury or pain.

- Once the animal can have more room and is permitted to perch/climb, provide sturdy branches with rough bark to aid their grip. Smooth bark branches are difficult for animals to climb on when they are recuperating from fractures.

Arboreal Animals (ones that live in trees – possums, gliders, bats)

- Do not house arboreal animals in enclosures which are placed on the ground as this can be very stressful for the animal. Position the enclosure on a table at hip height or higher (particular for flying foxes), as this will minimise stress on the animal when a human is not towering over them.

- For arboreal animals which are allowed to move around a little, providing a few suitable branches in the enclosure will minimise stress as they will have something familiar to grip onto. Take care when providing foliage to ensure that their dressings, limbs or bandages do not become entangled. Careful monitoring is required.

Partial Paralysis

- Ensure that the enclosure is large enough for the animal to lie comfortably. If the enclosure is too small, it will prevent the animal from being able to lie flat and in a comfortable position. Too large an enclosure will encourage the animal to try to move around unnecessarily, which could cause additional damage or pain.

- Check the bedding frequently for urine and faeces (at least 4 times daily) and change when soiled. Laying on soiled bedding is extremely stressful for an animal and can cause fur loss, ulcers and bacterial or fungal skin infections. The animal must also be turned after each bedding change to ensure correct blood flow and reduce the risk of pressure sores developing. When working with a large animal such as a macropod in these conditions always work at their level (on your knees) this will reduce the stress on the animal and they will be less reactive to your presence.

Red-necked Wallaby with paralysis in hind legs. He was placed on a soft Snooza® bed with towels underneath for warmth and to keep him dry. He had grass placed within easy reach.

Credit: Karen Scott

Wound Management

- Ensure that wounds are monitored closely, and bandages changed as per the vet's instructions.
- If the wound looks as though it is becoming infected, the bandages become soiled, you are unable to change or replace it, or it has an offensive odour, take the animal back to your vet for re-assessment as soon as possible.
- If the wound has become fly-blown, take the animal back to your vet for treatment immediately.
- Ensure that any dressings and bandages are kept clean. For animals which are prone to soiling their bandages, place an additional layer of bandage around the area (e.g. Vetwrap®) so that this can be regularly removed and replaced without interfering with the wound dressings underneath.
- Ensure that dressings and bandages are kept dry (unless waterproof bandaging has been applied). In some cases, water dishes will need to be removed from the enclosure and water offered by hand (or in a smaller dish) at regular intervals throughout the day/night (as appropriate) to prevent the dressings from becoming damp.
- Ensure that you closely monitor the animal's pain and discomfort. If you feel that the animal is in pain, consult with your vet.

Monitoring Urine and Faecal Output

- For animals with partial paralysis, particularly in the hind quarters, it is particularly important to monitor the urine and faeces output. You must assess whether the animal is urinating voluntarily or whether the muscles of the bladder have been affected and the animal is "leaking" urine as the bladder becomes overfull. If the latter is occurring, you will need to consult your vet.
- Monitor the faeces for signs of loose motions or diarrhoea. If diarrhoea occurs, discuss this with your vet. In some cases, this can be dietary or stress related, but it could also be associated with a bacterial or candida infection.
- Be aware of the individual requirements of the animal you are caring for, for example, turtles will generally not urinate or defecate unless they are in water. When treating turtles, they will need to be placed into a large tub of water every few days so that they can pass urine and faeces.

Handling

- When caring for a sick or injured animal, feeding, medicating and cleaning should all be done at the same time if possible, to reduce handling and stress on the animal. Ensure that you have everything at hand before you begin.

- Ensure that injured animals are handled carefully and appropriately. For animals with spinal damage, lift them in such a way that their spine stays straight. For animals with fractures, do not handle the injured limb/wing unnecessarily -and always provide support in the form of a blanket or towel.

- Be careful when handling certain animals as some are more prone to losing feathers or fur (e.g. bandicoots and some bird species such as rainforest pigeons).

- Wear protective clothing when dealing with diseased or contagious animals. A man's long sleeve shirt or t-shirt is ideal as an overcoat or invest in some cheap scrub tops, and a pair of Crocs® to use inside the enclosure that can easily be disinfected after use.

Recumbent Patients (animals that are unable to move about freely)

- In the case of animals which are recumbent you will need to turn the animal frequently (2-3 times daily) to prevent ulcers occurring. This also serves to maintain adequate blood flow to all areas of the body and helps to alleviate discomfort.

- Grooming is a very important aspect of for wild animal behaviour. Most species of wildlife groom themselves in some manner, whether it be birds that preen their feathers to keep them clean or mammals that use their grooming claws to groom their fur.

- For birds, you may need to clean the birds vent or tail feathers if they are unable to defecate properly. Birds may benefit from a light misting of tepid water to encourage them to groom.

- For mammals, you may need to clean the fur around the cloaca and tail area (particularly for paralysed animals). Some species may benefit from brushing their fur lightly, or in the case of young animals gently wiping with a warm moist cloth.

- For mammals, matted fur should be combed or cut to prevent bacteria or fungal infections developing underneath.

- For reptiles, you may need to provide a light misting of tepid water. Some species may benefit from soaking in a shallow container of water. Sloughed skin can be moistened and gently pulled from the reptile's skin, but only remove if it comes away easily.

- Recumbent animals should ideally be cared for in a wildlife hospital.

Common Brushtail Possum suffering from burns to hands and feet. Her bedding consisted of soft towels underneath and around her for support.

Credit: Kathryn Kielly

Medicating

- You must follow the instructions provided by your vet when administering medications. Ask your vet to write down the specific instructions and do not be afraid to ask if you do not understand them.
- If the animal is scheduled for re-assessment by your vet, ensure that you take the animal on the nominated day. If you are unable to return the animal on that day, discuss with your vet.
- You must administer medications on a regular basis – for example, medications which require administration 4 times a day need to be administered every 6 hours around the clock (e.g. 6am, 12pm, 6pm and 12am) and not 4 times within a 12-14 hour period.
- Medications must be stored appropriately so that they remain effective. For example, some need to be refrigerated and have a short shelf life once reconstituted, others need to be stored in a dark area. If you are unsure, ask the vet or vet nurse.
- Try to medicate animals in conjunction with other activities (such as cleaning enclosures) to minimise handling and stress.
- Dispose of medications properly or return any excess to the prescribing vet after the animal for which they were prescribed for no longer requires them. Do not use them on other animals or keep them past their use by date. Administering the wrong antibiotic or drug can inhibit an animal's recovery or cause its death.

Lorikeet willingly accepting medication from the end of a syringe.

Credit: AZWH

Debilitated Animals

- Animals suffering from mouth injuries may require their food to be chopped up very finely or even pureed. For example, animals with lacerated tongues, fractured teeth or jaw injuries.
- You must monitor the animal's food intake to ensure they are consuming sufficient food to maintain their weight. It is difficult with some species to calculate the amount of food consumed. Ensuring that you weigh the animal regularly will assist with this.
- Some animals may require hand feeding to encourage them to eat. For animals with injuries to their hands/feet which rely on them to feed (e.g. possums, parrots), they may have difficulties feeding and you may need to hold the food (either with your fingers or with tweezers) while they eat. Some animals may need to be hand-fed to encourage them to eat, for example, placing fresh vegetation at the possum or koala's mouth to entice them to feed.
- Some animals may require force feeding. If an animal does not feed voluntarily within 24 hours, contact your Species Coordinator for advice (earlier for baby mammals and birds). Compromised animals can lose weight and body condition very quickly.
- Animals which do not commence self-feeding feed quickly should be re-assessed by a wildlife vet to ensure that no other injuries have been overlooked. Reluctance to feed can also be an indication of pain or stress so it is important to re-assess the animals' treatment plan.
- Some birds may need to be crop-fed if they are not self-feeding. Contact your Bird Coordinator for advice in this regard.
- Some animals may need additional supplements to assist with healing such as those with fractures, burns or extensive wounds. They may need to be offered high-protein supplements such as Infasoy® "paste", Farex® or OxBow Critical Care®. Discuss with your Species Coordinator and/or wildlife vet regarding suitable options.
- Be aware of individual feeding requirements of the species you are caring for. For example, turtles will generally not feed unless they are in water.

Bearded Dragon being forced fed a protein supplement with a syringe and fruit with tweezers.

Credit: AZWH

Common Brushtail Possum being fed by syringe a high protein supplement to aid in her recovery from burns to her hands and feet.

Credit: Kathryn Kielly

Food Dishes

- Take note of where food dishes are placed in the enclosure. If the animal is unable to climb, do not place food dishes high in the enclosure – ensure that they are within easy reach.
- Present the food in as natural a manner as possible. The use of shallow glass dishes nestled into leaf litter is likely to be more enticing to an animal than a brightly coloured dish.
- Ensure that uneaten food is removed at the end of the day (or earlier for food that spoils easily). Uneaten food will attract insects and rodents that may harm debilitated animals.
- Be careful when offering live food to debilitated animals. Live food such as mealworms, have been known to kill small animals which are incapacitated, particularly giant mealworms.

Feeding Regime

- Ensure you are familiar with both the natural and supplementary diets of the animal you are caring for. For example, if caring for possums, gliders or koalas you must be able to adequately identify appropriate food trees.
- Ensure you are familiar with the frequency in which the species feeds. For example, some species such as snakes only need to be fed once a week whereas orphaned or juvenile animals will require more frequent feeding (as much as 7-8 times a day).
- Ensure you understand the natural feeding patterns of the species (e.g. feeding nocturnal animals at night).
- Ensure the size of the food offered is appropriate for the size of the animal. Feed smaller pieces to small animals and medium-larger pieces to larger animals. For example, a small juvenile snake will not be able to consume a furred mouse and would need to be offered a small pinkie mouse. Species which hold their food in their hands (such as parrots and possums), need larger pieces of food which they can hold onto while they eat.
- Offer a variety of food to the animals in your care – do not offer the same food day after day as the animal will lose interest. After all, most species in the wild do not eat the same thing every day.

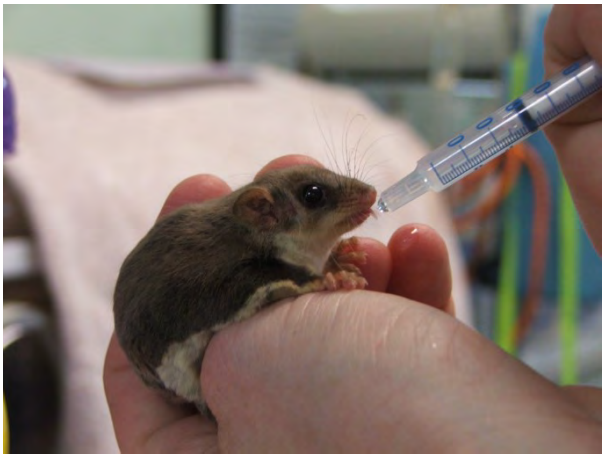
- Ensure the food provided is balanced – you may need to add a vitamin or mineral supplement. For example, if feeding meat to carnivorous birds you may need to add a calcium supplement. Discuss this with your Species Coordinator or refer to individual species training manuals.

- For seabirds, you may need to provide seabird tablets.

- Be aware of associated health problems which may occur in rehabilitating animals such as oral thrush. Consult with your vet if in doubt.

Dehydrated Animals and Birds

- The fluid intake of dehydrated animals needs to be monitored very carefully. Dehydrated animals will be reluctant to feed and will become lethargic and weak.
- Some animals and birds will need to be offered water regularly by either syringe, eye dropper or by placing the bowl to the animal's mouth.
- If you cannot rectify the animal's hydration level orally, contact your Species Coordinator or vet for advice – the animal may need to be given fluids by an alternative means such as subcutaneous fluids, intravenous fluids or directly into the crop (for birds).
- Some animals will be more inclined to drink water if it has something added to it such as Lectade® (for mammals) or Spark® (for birds) or a small amount of juice (bats).
- Animals that are drinking excessively should be re-assessed by your vet.



Feathertail Glider being orally rehydrated with water and glucose from a 1ml syringe.

Credit: AZWH

Water Dishes

- Take note of where water dishes are placed in the enclosure. If the animal is unable to climb, do not place the water dish up high in the enclosure – ensure that it is within easy reach.
- Use an appropriately sized water dish. Compromised animals can drown in water dishes if they accidentally fall in and are too weak to climb out.
- Ensure that the water dish is large enough for the animal to drink from. For example, birds such as kookaburras "scoop" water up in their beak and therefore require a wide dish. A small "D" cup will not be suitable.
- Use heavy ceramic bowls for animals which are more likely to overturn their bowls (e.g. echidnas).

Prioritising Between Animals

- Ensure that the healthiest animals are fed and tended to first before sick ones.
- Do not share equipment and dishes between animals without them being appropriately cleaned and sterilised.

Zoonotic Diseases

- Ensure you are familiar with zoonotic diseases that may be associated with the animals you care for. If you become unwell, tell your GP that you are a wildlife carer and what animals you have been in contact with and their conditions/diseases.

For more detailed information refer to Section 4 – Hygiene, Quarantine and Zoonotic Diseases.

Record Keeping

Record keeping is one of the most important aspects of wildlife rehabilitation but is often one that is overlooked by rehabilitators. It is a condition of holding a Permit Authorisation/ Endorsement from wildlife care groups.

Information that must be recorded when an animal first comes into care includes:

- The date the animal was found
- The date the animal came into care (this is sometimes not the date the animal was found)
- The exact rescue location of the animal
- The contact details of the caller (name, telephone, address)
- Why the animal came into care (e.g. injury, disease, orphaned)
- Animal species
- Age group (i.e. young, subadult, adult, dependant, independent).

Keeping accurate records of your animal's progress whilst in care is also very important. Some of the information which should be recorded regularly includes:

Weight of the animal

The weight of the animal should be recorded at regular intervals, generally at least once a week whilst receiving treatment and once a fortnight when in outdoor rehabilitation facilities. Some animals need to be weighed more frequently (e.g. every 2-3 days).

Veterinary treatment that the animal receives

It is important that detailed information is recorded of any veterinary treatment provided. If an animal requires further assessment or treatment, a different vet may need to see the animal. Having accurate records makes the vet's job a lot easier and may prevent the double-up of diagnostic tests. Take your animal's progress charts with you and ask if they could write details of the treatment (and results) on your record sheet.

Where wildlife is treated at a wildlife hospital, you will generally be provided with a Discharge Form which will include this information.

Medications administered

You must maintain accurate records of any medications administered including the name of the medication, the amount administered, the frequency administered, the concentration of the drug (if applicable) as well as the start and finish dates.

Take your progress chart with you when attending your vet and ask the vet to write the details of any medications administered. This will assist the vet (or another vet) when the animal is due for re-assessment.

Any change in condition

Any change in your animal's condition should be recorded. Examples of changes you might record may include:

- "Appeared brighter today"
- "Starting eating leaf today (blue gum tip)"
- "Was grooming himself today"
- "Perching on branch today"
- "Flying short distances"
- "Was climbing branches more confidently"
- "Offered lilly pilly tip – was not interested at all"
- "Was teeth grinding –pain?"
- "Blue tinge around mouth – seemed more lethargic today"
- "Had diarrhoea today"

Any changes in development

Changes in development, particularly for orphaned joeys should also be recorded. For example, when eyes started to open, when fur first appears, first ventures from pouch, first eating solids etc.

Veterinary Records

With the exception of specialised wildlife hospitals, most veterinary surgeries do not keep individual records for wildlife patients in the same way that they do for domestic animals. It is up to YOU as the wildlife rehabilitator to ensure you keep an accurate and up-to-date record of your animal's treatment.

We encourage you to keep a supply of Rescue Examination and Record Sheets for each species handy as these are an excellent way of ensuring that a full and accurate assessment has been provided. There is also room on the back of the form (progress chart) to record the ongoing progress of your animal.

When caring for orphaned joeys, more information is generally recorded including details of how much food was offered and how much was actually consumed, the frequency of passing of urine and faeces.

For wildlife rehabilitators that have multiple animals in care, keeping a "Weekly Schedule" of routine tasks can be beneficial. An example of this is included in the Appendix.

A blank template of the Weekly Schedule is also attached in the Appendix.

These forms are available to download from the Wildcare website under the Carers Resources tab.

Deceased Animals

Dealing with deceased animals is an unfortunate part of wildlife rehabilitation. As distressing as it is for many rehabilitators, we encourage you to take the opportunity to learn from those animals which have died whilst in your care. Performing a thorough examination or post-mortem for example, is an excellent learning tool for rehabilitators. If you learn nothing from an animal's death, then the animal has died in vain. If you learn something, then it may serve to save another animal.

When an animal dies in your care

If an animal dies in your care you should give consideration as to why it died.

If you have just rescued a badly injured bird and it dies shortly after arriving home, then you could safely say that it died from its injuries. In these situations, take the opportunity to conduct a thorough assessment and complete your Rescue Examination and Record Sheet – consider this to be a great learning opportunity.

If you have already conducted a thorough assessment and the animal dies – whether it is a day or a week afterwards – still take the time to conduct a further thorough assessment to ensure you didn't overlook something in your first assessment. If you do find that you missed an injury, make a note so you learn from the experience. Wildlife rehabilitators will make mistakes and overlook injuries – but make sure you learn from each experience to prevent it from happening again.

If an animal dies which has been in your care for a considerable time (say weeks or even months) and it is not obvious why the animal died, it is prudent to try to establish why. Even if you think you may have contributed to the animal's death – it is better to learn and know for sure than to always wonder. You also need to bear in mind in these circumstances, that the animal may have died from an illness which may be contagious to other animals still in your care.

Necropsy Procedures

A *necropsy* is the examination of an animal, after it has died, to determine the abnormal and disease-related changes that occurred during its life.

Necropsies are done for a variety of reasons including:

- To determine the actual cause of the animal's death
- To determine the accuracy of the clinical diagnosis
- To determine whether there were any undiagnosed conditions
- To evaluate the positive and negative effects of treatment

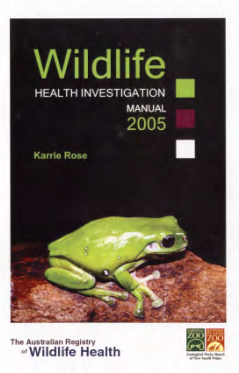
A necropsy can be performed either by your local veterinarian, specialist wildlife hospital or by an experienced wildlife rehabilitator. In some circumstances, it is imperative that the necropsy is conducted by a wildlife veterinarian so that samples can be sent for pathology testing. If you feel this is warranted, please contact your appropriate Species Coordinator or vet to discuss further.

If you do think a necropsy is warranted, it is important that the animal is stored appropriately so the body is preserved.

As soon as possible after death, place the animal in a body bag or several plastic bags and place the animal in the bottom of the refrigerator. Do not place the animal in the freezer. For the best results, the necropsy should be conducted with 24 hours from the time of death.

As you become more experienced as a rehabilitator, you may find yourself curious about the internal anatomy of the animals you care for. This is a natural progression of wildlife rehabilitation. Specialised workshops are conducted periodically through Wildcare to teach rehabilitators the correct method of performing a gross necropsy.

There is an excellent reference book called "Wildlife Health Investigation Manual" published by the Australian Registry of Wildlife Health which has excellent photos and diagrams of Australian native wildlife that will assist you.



This publication is available at www.wildlifehealth.org.au

Disposal of Carcasses

All deceased animals should be disposed of in an appropriate manner. You should check with your local Council as to the appropriate method of disposal permitted in your Council region.

Appropriate methods of disposing of deceased wildlife include:

- Burning by incineration
- Burying – animals should be buried to a depth of at least 45cm. Rocks or logs should be placed over the animal to help prevent domestic or wild dogs or foxes digging up the carcass.
- Refuse Station – Most Councils have public refuse stations that specifically cater for the disposal of deceased animals. Many of the Councils will allow wildlife rehabilitators to dispose of animals at no cost. When taking diseased animals or birds to refuse stations, ensure they are contained securely in a plastic bag or body bag to ensure scavenging animals or birds do not eat the carcass.
- Leave the body in the bush to decompose – This provides other wildlife with an opportunity to eat the carcass. Ensure the animal is left sufficient distance away from residential homes. **Only animals that have died from trauma injuries should be disposed of in this manner – do not dispose of diseased or euthanised animals in this manner.**

If an animal is euthanised by your vet, they should organise its disposal. Animals that have been euthanised by veterinary euthanasia drugs need to be disposed of by either burying or incineration. **Do not leave the carcass in the bush for other animals to eat.**

Storage of Carcasses

As morbid as it seems, wildlife rehabilitators often store deceased animals in a freezer for various reasons. Sometimes it may not be convenient to take the animal to a refuse station at the time the animal dies and in some instances, good specimens may be frozen for educational purposes at workshops. In some cases, carcasses are frozen so they can be provided to museums.

If storing carcasses in a freezer, we recommend you have a separate freezer specifically for this purpose – they should not be stored with human food.

The plastic bag containing the carcass should be clearly labelled with the species, the date of death, the cause of death and whether the animal died or was euthanised.

Please note it is illegal for a person to have possession of a native animal carcass (including parts thereof – teeth, fur etc) without a permit.

Use of Carcasses to Feed Other Wildlife

There are restrictions imposed on wildlife rehabilitators on whether the carcasses of native wildlife can be used to feed to other wildlife in care. In Queensland, the *Code of Practice – Care of Sick, Injured or Orphaned Protected Animals in Queensland* sets out the requirements in this regard.

Wildlife rehabilitators are permitted to collect fresh "roadkill" for the purpose of feeding raptors only. However, there are restrictions – for example, koalas and echidnas cannot be used. Refer to the *Code of Practice – Care of Sick, Injured or Orphaned Protected Animals in Queensland.*

Deceased sick wildlife should not under any circumstance be offered to a raptor because of the risk of contamination. However, an animal that has died due to traumatic injuries could be used.

The Role of Euthanasia in Wildlife Rehabilitation

Unfurred Eastern Grey Kangaroo joey
Credit: Ben Nottidge

The following Section is based on a paper "Management of Critically Ill Wildlife – The Reality and Practice of Wildlife Euthanasia" by Dr Jon Hanger and Dr Andrew Tribe (2005).

For many animals presented to wildlife carers, veterinarians or rehabilitation centres, the most humane course of action is euthanasia. The most common reasons for this are serious illness or injury, lack of resources, lack of viability (small joeys), or because the animal is feral. Whatever the reason, the decision to euthanise is generally an ethical one that is based upon minimising or relieving the suffering of an animal. Once a decision to euthanise has been made, it should be performed promptly by a suitably qualified or experienced person. Although not a pleasant task, it is important that wildlife rehabilitators are trained to perform euthanasia. Acceptable techniques for euthanasia vary depending upon species, size and availability of veterinary support and resources. Certain states allow for the possession and use of some restricted drugs by appropriately trained laypersons, others do not. This section outlines the important principles of euthanasia and gives some guidelines for acceptable techniques that may be used for species commonly presented for care.

Commonly, as wildlife rehabilitators, we are confronted with wildlife affected by severe injuries or illness. Given the high potential for suffering, these animals must be treated with sensitivity, compassion and prompt and appropriate veterinary attention. The purpose of this section is to assist wildlife rehabilitators to confidently assess these cases and perform euthanasia or seek the assistance of a Trauma Carer or veterinarian.

Although euthanasia is a sensitive issue for wildlife rehabilitators, particularly new rehabilitators, it is a fact of life. Euthanasia is one of the most common veterinary procedures performed on wildlife by both veterinarians and wildlife rehabilitators.

It is important to realise that euthanasia is not an indication of failure, it is an act based on ethics and compassion.

It is a decision that recognises the following facts:

1. That we cannot save every injured animal's life.
2. That we cannot cure every illness in wildlife.
3. That we cannot provide facilities and resources for the care of every sick or injured wild animal.
4. That we do not have the resources to house every unreleasable animal to a standard that ensures good quality of life.
5. That our primary role as wildlife carers is the relief of suffering.

Importantly, as effective and compassionate wildlife rehabilitators, we must acknowledge these facts. One of the most important realisations is that our most important priority is not to attempt to save every life, but to make decisions based upon the best welfare of the animal – decisions that commonly result in euthanasia.

Euthanasia is one of the most common veterinary techniques used in wildlife medicine. Its aim is to relieve suffering by causing a rapid, painless and relatively comfortable death to those animals with severe injuries, illness or debility. Euthanasia may also be performed on healthy animals: for example feral animals, or joeys that are too young to be successfully reared. Whatever the indications for euthanasia, its objectives remain the same:

To cause immediate or rapid loss of consciousness, followed by death, with a minimum of pain, discomfort or distress.

EUTHANASIA = GOOD DEATH

Making the Decision to Perform Euthanasia

In some cases, making the decision to perform euthanasia on an animal can be an easy one (although not always a happy one). For example: animals with severe trauma or untreatable disease should give no difficulty in making that decision. However, some cases may not be so straightforward. It is sometimes helpful to consider the following factors:

1. Does the animal have injuries or illness that can be treated successfully? Or, is the joey developed enough to have a good chance of survival?
2. Is (are) there suitable rehabilitators available and capable of caring for the animal for its complete period of rehabilitation?
3. Is there suitable habitat available for the animal to be released into, or a captive institution appropriate for it?
4. Is there appropriate veterinary care available?
5. Is the animal an endangered or rare species?
6. Does it have a GOOD chance of survival in the wild following rehabilitation?

If the answer to some of these questions is NO, then euthanasia may be the most appropriate course of action even if the injuries or illness are not so severe as to normally warrant euthanasia. Also, the rehabilitation and release of geriatric animals that are unlikely to contribute reproductively to a population is questionable.

The question of BAD LUCK versus BAD GENES

Often, wild animals are presented to us because they have been injured or become sick through **BAD LUCK**, often as a result of human activities. Sometimes, however, animals are found in a sick or weakened state without apparent accidental causes. Before treating and releasing these animals, we must first consider whether the illness or failure to thrive, or whatever, is as a result of **BAD GENES**. Natural selection ensures that only the fit animals survive, particularly in times of hardship. During these times, the less genetically "fit" animals die.

This phenomenon ensures the constant "testing" of a species' genes, and selection for "strong genes". If we continually rescue and rehabilitate individuals that are found in a weak or debilitated state, or dying because they are not as strong as others of their species, then we are giving a selective advantage to animals with "weaker" genes, rather than letting nature get rid of those genes. Flying foxes and muttonbirds are just some examples of species for which we may not necessarily be doing the right thing by saving all of the weak individuals.

It's a concept worth thinking about, even if it is hard to put into practice sometimes.

Euthanasia Techniques

The basic requirement for a euthanasia technique is that it causes immediate or rapid loss of consciousness and/or death with a minimum of pain, discomfort and distress. Furthermore, the manner in which an animal is treated, handled, contained and restrained before and during euthanasia is as critical for its welfare as the euthanasia technique itself.

Most effective euthanasia techniques therefore require destruction or damage to the brain, or chemical suppression of brain activity. Other desirable characteristics of euthanasia techniques are that they:

1. Can be performed easily and safely by trained rehabilitators;
2. Are reliable (i.e. reliably cause rapid and painless death);
3. Affect necropsy findings minimally;
4. Are aesthetically tolerable.

Clearly no technique is perfect in all respects, but the use of veterinary euthanasia solutions provides the most effective and acceptable (aesthetic) form of euthanasia for most cases. However, the use of these solutions is regulated by State drugs and poisons legislation such that very few people other than veterinarians may legally possess and use them.

In Queensland, we are very fortunate that Queensland Health does provide this option to appropriately trained and endorsed wildlife rehabilitators.

The following are some other methods that when performed by capable persons are relatively humane:

1. Trauma (such as shooting or clubbing) and, under certain circumstances and for certain species, the following:
2. Asphyxiation with carbon dioxide gas (not readily available to most rehabilitators).

The following methods ARE NOT HUMANE AND SHOULD NEVER BE USED. They DO NOT fulfil the requirements of euthanasia:

- Physical asphyxiation
- Drowning
- Hypothermia (placing in the freezer)
- Decapitation

Any method that does not induce instantaneous or rapid loss of consciousness without pain, discomfort or distress is not a euthanasia technique, and its use is not excusable under any circumstance.

Veterinary euthanasia solutions

Most veterinary euthanasia solutions contain a drug called sodium pentobarbitone, which causes anaesthesia, and stops the heart and breathing at high doses. There are some important considerations in the use of these solutions though:

1. They may only be kept and used by registered veterinarians or other persons appropriately licensed by state health authorities.
2. They are extremely irritant to tissues and have the potential to cause severe pain if used or injected inappropriately.
3. They are hazardous for human health if injected or ingested accidentally (or deliberately) at relatively small doses.
4. Carcases of animals containing this drug can cause death of animals ingesting the carcase (such as goannas).

To achieve highly concentrated solutions of sodium pentabarbitone, the solutions are made quite caustic, which makes them very damaging to tissues. These solutions can cause severe pain and tissue necrosis (death) if injected by inappropriate routes, or by accidental injection into tissues. Even by the intravenous route, some conscious animals (particularly reptiles) demonstrate significant pain responses upon injection of the drug. Almost invariably now, wildlife presented to wildlife hospitals are anaesthetised prior to injection of veterinary euthanasia solutions.

If anaesthesia is not available, then the following routes are recommended to cause minimal pain and distress on injection:

- Intravenous (into a vein)
- Intraperitoneal (diluted at least 50%) (into the abdominal cavity)
- Intrahepatic (diluted 50% and injected slowly) (into the liver)

Intracardiac injection is not desirable in conscious animals.

Injection of euthanasia solutions into conscious reptiles by any route may cause pain and should be avoided if anaesthesia is not possible. Cranial trauma is a more rapid and humane method of euthanasia in these cases.

Trauma as a method of euthanasia

Although requiring some mental fortitude and being somewhat unaesthetic, cranial trauma is the most humane method of euthanasia that is available to wildlife rehabilitators *if performed appropriately*. Most wildlife rehabilitators will have to do it at some stage – so learn how to do it well.

All methods of euthanasia using trauma should aim to cause destruction of, or damage to the brain sufficient to induce immediate loss of consciousness, followed shortly afterwards (and before return of consciousness) by death. Any techniques that do not fulfil these requirements are not acceptable methods of euthanasia, except in extreme circumstances. Remember: all methods of euthanasia should reduce the suffering or distress of an animal – not add to it.

Anatomical considerations:

It is desirable to have some understanding of the anatomical location and size of the brain in species which may be candidates for euthanasia by trauma. In most species, the brain occupies a relatively small proportion of the total head size, and any technique must aim to ensure that the brain is the target of the trauma, not the muzzle, eyes or beak, for example. Particularly in reptiles, the brain is very small relative to the size of the head, and well protected in the braincase and by surrounding tissues, particularly the muscles. In small animals and reptiles it is essential to totally destroy the head to ensure that the brain is destroyed. Decapitation alone IS NOT desirable in any species, particularly reptiles. Refer to Appendix 2 showing the relative sizes and positions of the brain in various taxonomic groups.

It is preferable that traumatic methods of euthanasia NOT be performed in the presence of members of the public or with an audience. Many people find such methods deeply disturbing and it does not present a professional front to the public, even if it is necessary occasionally.

The following trauma techniques can be humanely used to perform euthanasia:

1. Shooting

This is only really appropriate for large macropods, and in situations in which there is a clear and safe line of sight to the brain. Occasionally, it may be used for small mammals (such as flying foxes) or birds in cases in which there is no other access to the animal, for example: animals caught up in wires or fishing line high in a tree. A firearms licence is required to keep and use a firearm, and it is advisable to contact the local police before discharging firearms. The brain occupies the portion of the head between the eyes and the base of the ears. An appropriate projectile should be used to destroy that portion of the head. The gun must be sighted in perfectly prior to taking the shot – accuracy is paramount in ensuring the brain is destroyed. For animals that are inaccessible (such as high in a tree) a pair of binoculars is useful the check that the job has been done properly. Needless to say, guns are dangerous and should only be used by very experienced and responsible persons.

2. Clubbing

It is preferable to use a heavy steel bar, hammer or similar, and ensure that your aim is perfect. The animal should be immobile or adequately restrained to ensure your accuracy. Remember: the only acceptable outcome of this technique is immediate loss of consciousness, and destruction of the brain.

3. Flicking

This technique is only suitable for smaller mammals and birds, and involves grasping the animal by the hind limbs and/or tail (with its front or belly facing you), and rapidly flicking its head down onto a hard object such as concrete or the edge of a brick. If effective, the skull should sustain multiple fractures and the brain destroyed or badly damaged. It is not a reliable technique for reptiles because their brain is small and very well protected by the soft tissues and bones of the skull.

DO NOT ATTEMPT ANY TRAUMATIC EUTHANASIA TECHNIQUES HALF-HEARTEDLY.

Perform them only if you are confident that you can perform them effectively and humanely.

What to expect with trauma as a euthanasia technique:

If performed effectively, trauma should result in immediate loss of consciousness. This is determined by loss of coordinated movement and loss of the palpebral and corneal reflexes (shutting the eye when it is touched). It is usual for there to be some reflex movement such as kicking with the hind legs (in mammals) or flapping of the wings in birds. This should not persist for more than 1 minute. If the euthanasia has been successful, then breathing should stop virtually immediately, and the heart should stop within minutes.

Traumatic methods of euthanasia are generally not something that you can get used to or feel at ease with. If you are, then you should probably not be a carer. Unfortunately, they are necessary on occasion.

Confirmation of death in animals subjected to euthanasia techniques:

In animals subjected to euthanasia techniques, particularly chemical methods, death must be confirmed definitively before disposal of the carcass. When trauma is used as a method of euthanasia, and destruction of the brain has been achieved, then this is sufficient. In all other cases, however, observation of cardiac arrest must be observed for at least 1 minute in mammals and longer in reptiles. Lack of blink (corneal) reflex is not a sufficient confirmation of death.

Disposal of carcases following euthanasia:

Carcases that have been injected with intramuscular anaesthetics, such as Zoletil, and then subsequently euthanized with veterinary euthanasia solutions by any route, pose a health hazard to animals that may scavenge the carcass. It is therefore important that carcases of animals subject to euthanasia using pharmacological methods are disposed of by being wrapped in plastic and buried at a depth of 600mm or more, or alternatively, incinerated. Carcases of animals subjected to euthanasia using trauma, carbon monoxide, carbon dioxide or chloroform inhalation pose little threat to scavengers, and can be disposed of in appropriate areas of bushland.

Summary

1. The keys to humane management of critically ill patients are: thorough examination; appropriate pain relief; close monitoring; and timely euthanasia when required.

2. Euthanasia is an important and compassionate technique in the management of wildlife with severe trauma and disease.

3. Euthanasia is a technique that is COMMONLY indicated, and is far preferable to allowing an animal to die from traumatic injuries, disease or inadequate care.

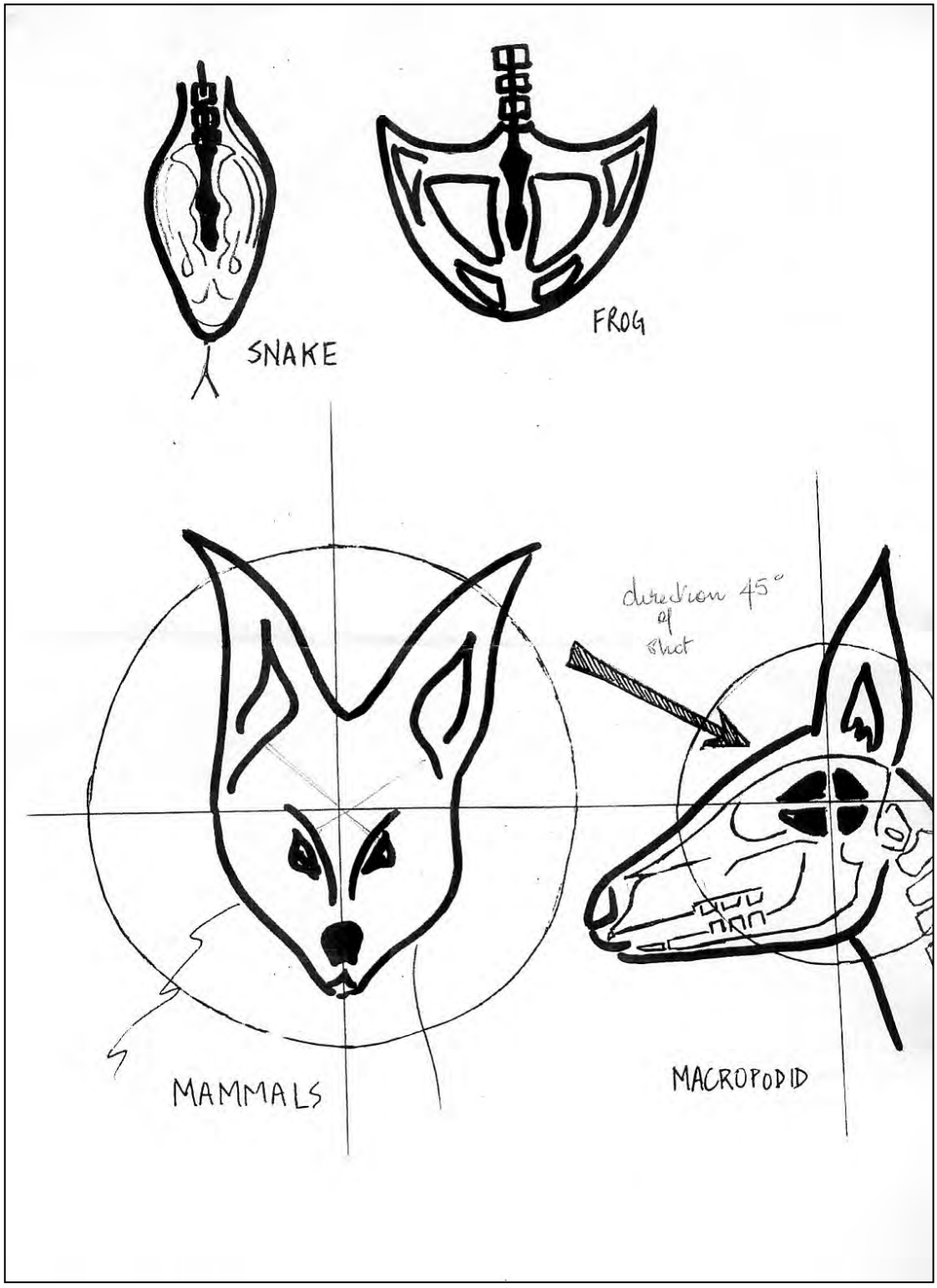
4. Animals requiring euthanasia, or that have severe trauma or disease that may warrant euthanasia are VETERINARY EMERGENCIES, that ethically and legally must be dealt with appropriately and promptly.

5. The species coordinators have been trained in euthanasia techniques and should be consulted by rehabilitators requiring assistance with patients. Alternatively, veterinary assistance may be sought as appropriate.

6. Euthanasia techniques such as trauma and chloroform intoxication may be performed by rehabilitators adequately trained in these techniques.

7. Drowning, hypothermia and other methods that cause significant pain, distress or discomfort to animals must NEVER be used as euthanasia techniques.

Diagram showing relative sizes and position of the brain in various taxonomic groups.



References and Glossary

Green Tree Frog
Credit: Annette Bird

Recommended Reading

Below is a list of publications that wildlife rehabilitators may find useful.

Natural History

CSIRO Publishing have a series of books called "Australian Natural History Series" which includes comprehensive information on how species live in the wild. These are an essential resource for wildlife rehabilitators. Remember, without knowledge of how they live in the wild, we cannot adequately care for them during their rehabilitation.

Note: Some of these publications are now out of print but are available as eBooks through various online book sellers. There can also sometimes be found on eBay.

- Australian Magpie
- Bettongs, Potoroos and the Musky Rat-Kangaroo
- Bowerbirds
- Cockatoos
- Echidna
- Flying Foxes
- Goannas
- Herons, Egrets and Bitterns
- Kookaburra
- Mound-Builders
- Native Mice and Rats
- Platypus
- Possums
- Tawny Frogmouth
- Tree-kangaroos
- Wedge-tailed Eagle
- Wombats
- Kangaroos

Rescue and Rehabilitation

The following publications are not Australian however many of the principals can be adopted to suit our native Australian wildlife.

Wildlife Search and Rescue; A Guide for First Responders
Rebecca Dmytryk, 2012. Published by John Wiley & Sons Ltd

Practical Wildlife Care
Les Stocker, 2005. Published by Blackwell Publishing.

Veterinary Disaster Response
2009. Published by Wiley-Blackwell.

Veterinary (General)

These publications relate to the general health of domestic animals, livestock and some wildlife. They are very good resources though to help wildlife rehabilitators understand the fundamentals of assessment and health of animals.

Medical History and Physical Examination in Companion Animals
2009. Published by Elsevier Limited

The Merck/Merial Manual for Pet Health (Home Edition)
2007. Published by Merck & Co Inc.

An Illustrated Guide to Veterinary Medical Terminology
2000. Published by Thomson Delmar Learning.

Clinical Anatomy & Physiology for Veterinary Technicians.
2002. Published by Mosby Inc.

Veterinary (Australian Wildlife)

The following are excellent publications specifically relating to the biology, management and veterinary treatment of Australian wildlife. While these publications may be more advanced than what wildlife rehabilitators will generally require, they are an excellent investment if you wish to further your knowledge.

Medicine of Australian Mammals
2008. Published by CSIRO Publishing.

Current Therapy in Medicine of Australian Mammals
2019. Published by CSIRO Publishing.

Australian Mammals; Biology and Captive Management
Stephen Jackson, 2003. Published by CSIRO Publishing.

The Australian Registry of Wildlife Health - www.arwh.org.au
This website has some excellent resources on common diseases in Australian native wildlife.

iTunes Applications

- *Veterinary Terms* (free) or *Veterinary Terms* + ($0.99)
- *Blacks Veterinary Dictionary* ($8.99)
- *Veterinary Dictionary* ($1.99) – Saunders
- *Veterinary* ($5.49)
- *Micromedex Drug Information* (free) – humans
- *Field Guide to Victorian Fauna* (free)

Field Guides

Wildlife of Greater Brisbane
Published by Queensland Museum

A Field Guide to the Mammals of Australia
2011. Published by Oxford University Press

A Field Guide to Reptiles of Queensland
2005. Published by New Holland Publishing

A Field Guide to Reptiles of Queensland
2005. Published by New Holland Publishing.

Tracks, Scats and Other Traces
2009. Published by Oxford University Pres

Australian Bats
2011. Published by New Holland Publishing

Field Guide to Australian Birds
2000. Published by Steve Parish Publishing.

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Bibliography

Dymtryk, R (2012) *Wildlife Search and Rescue; A Guide for First Responders.* Wiley-Blackwell, United Kingdom.

Hentz, PS (2009). *Rescuing Wildlife.* Stackpole Books, United States of America.

Stocker, L (2005). *Practical Wildlife Care: Second Edition.* Blackwell Publishing Ltd, United Kingdom.

Fowler, A. 2012. *Advanced First Aid for Marsupials.*

Walraven,E. (2004). *Care of Australian Wildlife.* New Holland Publishers, (Australia) Pty Ltd, Sydney Australia.

Dona, M, (2012) *Catch and Restraint of Wildlife for General Practice. Paper presented at Veterinary Nurses Council of Australia conference.*

White, S. (1997). *Caring for Australian Wildlife.* Australian Geographic, Terrey Hills, Australia.

Blood, DC et al (2007). *Saunders Comprehensive Veterinary Dictionary.* Elsevier, London, United Kingdom.

Grant, T (1995). *The Platypus – A Unique Mammal.* University of New South Wales, Sydney NSW 2052.

Lane, DR & Cooper B (2003). *Veterinary Nursing.* Butterworth-Heinemann, London, United Kingdom.

Lane DR & Cooper B (2004). *Dictionary of Veterinary Nursing.* Butterworth-Heinemann, London, United Kingdom.

Moore, PH (2006). *Fluid Therapy for Veterinary Nurses and Technicians.* Butterworth-Heinemann, London, United Kingdom.

Romich, JA (2005). *Fundamentals of Pharmacology for Veterinary Technicians.* Thomson Delmar Learning, New York, United States of America.

Romich, JA (2000). *An illustrated Guide to Veterinary Medical Terminology.* Thomson Delmar Learning, New York, United States of America.

McCurnin, DM & Bassert, JM. (2006) *Clinical Textbook for Veterinary Technicians.*
Jackson, S (2003). *Australian Mammals – Biology and Captive Management.* CSIRO Publishing, Collingwood, Victoria 3066

Martin, Roger & Handasyde, Kathrine (1988). *The Koala – Natural History, Conservation and Managementc*

Dawson, TJ. (1998) *Kangaroos, Biology of the Largest Marsupials.*
Illustrations by Musser, A., & Jillian Hallam
University of New South Wales, Sydney NSW 2052

Augee, M et al (2006). *Echidna: Extraordinary egg-laying mammal*
CSIRO Publishing, Collingwood, Victoria 3066

Parsons, H. (1999). *Caring for Australian Native Birds*. Kangaroo Press, Australia.

Hall, L & Richards G (2000). *Flying Foxes: Fruit and Blossom Bats of Australia*. University of New South Wales, Sydney NSW 2052

Lollar, A & Schmidt-French, B (2002). *Captive Care and Medical Reference for the Rehabilitation of Insectivorous Bats.* Bat World Publication, Mineral Wells, Texas, USA.

Mader, (2006). *Reptile Medicine and Surgery*. Elsevier, London, United Kingdom.

Carpenter, JW (2004). *Exotic Animal Formulary.* Saunders, United Kingdom.

Jackson, S. (2003). *Australian Mammals; Biology and Captive Management*. CSIRO, Australia

Vogelnest & Woods. (2008). *Medicine of Australian Mammals*. CSIRO, Australia.

Queensland Museum, (1995). *Wildlife of Greater Brisbane*. Queensland Museum, Australia.

Battaglia, AM. (2007). *Small Animal Emergency and Critical Care for Veterinary Technicians*. Saunders Elsevier, USA.

Colville & Bassert. (2002) *Clinical Anatomy & Physiology for Veterinary* Technicians. Mosby Inc. Missouri, USA.

Ballard & Cheek. (2003). *Exotic Animal Medicine for the Veterinary Technician*. Blackwell Publishing. Iowa, USA.

Judah & Nuttall. (2008). *Exotic Animal Care & Management*. Thomson Delmar Learning, New York, USA.

Mathematics Conversion Chart

Source - Clinical Textbook for Veterinary Technicians

ABBREVIATIONS	CONVERSIONS
Weight grain = grain gram = g kilogram = kg milligram = mg microgram - µg pound = lb	**Weight Conversions** 1 g = 1000 mg 1 mg = 1000 µg 1 g (mass) = 1 ml (volume) 1 kg (mass) = 1 L (volume) 1 lb= 16 oz 1 lb = 454 g 1 grain = 60 mg
Volume Cubic centimetre = cm2 Drop = gtt Gallon = gal Litre = L Millilitre = ml Ounce = oz Pint = pit Quart = qt Tablespoon = tbsp Teaspoon = tsp Unit = unit	**Volume Conversions** 1 L = 1000 ml 1 L = 32 oz 1 ml = 1 cm^3 1 drop = 0.05 ml 1 ml = 15-16 drops 1 tsp = 5 ml 1 tbsp = 15 ml 1 oz = 30 ml 1 gal = 3785 ml 1 pt = 473 ml 1 qt = 960 ml

Glossary

Source – Dictionary of Veterinary Nursing

Abdomen	The area between the diaphragm and the pelvis that contains the abdominal viscera
Abrasion	An open wound, usually with extensive loss of epithelial tissue, often painful owing to exposed nerve endings.
Acute	Adjective used to describe a disease of rapid onset, with severe and recognisable symptoms, but often a quick recovery occurs following treatment
Agonal breathing	The gasping type of respiration seen in a dying animal
Alopecia	Deficiency or complete loss of hair
Anaemia	Defined as the decrease in the number of red blood cells below the normal range for the species of animal concerned
Anaesthesia	A state of reduced perception of pain, show a loss of sensation or feeling in part or all of the body. General anaesthesia – loss of pain over the whole-body during unconsciousness of the brain induced by a chemical agent Local anaesthesia – sensation loss induced in a restricted part of the body where pain is not wanted.
Anaesthetic	Used to describe a drug that produces anaesthesia
Analgesia	Reduced perception of pain, without the loss of awareness
Anaphylactic shock	Peracute response to an antigen in a sensitised animal, characterised by collapse, difficulty in breathing and generalised permeability of the peripheral circulation.
Antibacterial	Substance that kills or stops the growth of bacteria
Antibiotic	Substance that is produced by micro-organims, or synthesised as a derivative, to kill or inhibit the growth of bacteria or fungi.
Antiseptic	Can be defined simply as a skin disinfectant. Includes any substance that inhibits the growth or spread of bacterial which is not harmful to animal tissues.
Apnoea	Temporary cessation of breathing
Arrhythmia	Loss of the normal regular heartbeat
Asphyxia	Starvation of oxygen through a restriction of inspired air reaching the lungs; suffocation
Ataxia	Unsteady walking, shaky or unbalanced gait
Barrier nursing	A term used in infectious disease nursing to describe isolation of the patient, using separate utensils, ensuring scrupulous

	attention to hands and clothing disinfection etc.
Bloat	Condition of distended abdomen either the result of gorging food or from an accumulation of gas in the stomach
Bruising	The effect of trauma with discolouration and haemorrhage; where there is a blood clotting disorder, bruises may develop from very trivial injuries. Colour changes in bruises are the result of the breakdown of the haemoglobin.
Burn	A severe injury to tissue caused by dry heat, chemicals, radiation or electricity. Injuries are characterised by necrosis, peeling of skin etc. Fluid losses may be anticipated; treatment for shock should be given and attempts made to prevent infection of the burn.
Caecum	The proximal part of the large intestine.
Capillary refill time (CRT)	Test used for quick assessment of shock or circulatory failure; pressure applied to the gum causes blanching and the time until the gum is pink again is measured in seconds.
Cellulitis	Skin infection in the deepest layers of the skin.
Chlorhexidine	An antiseptic used in solution as an effective skin disinfectant before surgery
Chronic disease	One that has been present for some time and does not immediately progress to cause the death of an animal
Cloaca	The external orifice of birds and reptiles, fulfils a dual function of excretion and of reproduction
Congenital	Condition present at birth; it may be hereditary or develop after some injury during pregnancy
Constipation	Faeces retained in the rectum and large intestine; hard lumps may be difficult to pass, and straining may occur
Contagious disease	A disease that may pass from one animal to another, by direct contact, by an object such as a brush or by a vector such as an insect bite. All communicable diseases are transmissible, unlike metabolic diseases.
Cornea	Surface of the eye that is transparent to light as it totally lacks blood vessels and is composed of layers or parallel tissue.
Crepitus	Grating feel or noise when broken bone fragments move across each other or roughened cartilage.
Cyanosis	Bluish appearance of the skin, tongue or mucous membranes caused by insufficient oxygen reaching the tissues.
Debridement	Cleaning up a wound by removal of contaminating foreign matter and devitalised tissue, healing then takes place by granulation if coaption is impossible.
Deep pain sensation	Pain measured by the animal's attitude and behaviour.

Dehydration	A reduction in the total body water content and the signs associated with deficiency of water in the tissues and circulation, caused by diseases, shock or inadequate fluid intake.
Dermatitis	Any inflammatory condition of the skin, especially from some outside influence such as bacteria, parasites, fungi and mechanical damage.
Diagnosis	The art and science of determining the cause of illness by considering the patient's signs and symptoms, the history provided by the owner, together with such laboratory tests and imaging techniques as needed.
Diarrhoea	Rapid passage of soft faecal matter from the intestines to the exterior; the passage of abnormally soft or liquid faeces is accompanied by fluid and electrolyte losses.
Discharge	Fluid flowing from a wound or body cavity
Disease	Any morbid disorder with a specific cause; signs and symptoms can be recognised. Injuries and accidents are excluded from this definition.
Disinfectant	Agent that destroys or removes all bacteria, viruses and fungi, includes environmental and skin disinfectants.
Dyspnoea	Laboured or difficulty breathing; may result from obstruction of the airway, various diseases of the bronchial tree and lung tissue or from heart disease.
Emaciation	Extreme thinness; may result from starvation, chronic disease etc
Enucleation	Total removal of the eyeball
Euthanasia	Humane destruction of an animal; means "good death"
Exudate	The fluid that oozes slowly out of damaged capillaries and dries to form a scab
Fracture	Complete break in the integrity of a bone; usually a result of trauma but can occur with little force if the bone is diseased.
Granuloma	Description of a tissue mass that has an appearance similar to granulation tissue. May appear like a tumour but is usually a result of a chronic inflammatory process.
Haemorrhage	The loss of blood from arteries, veins or capillaries. Haemorrhage may be classified as internal or external; other descriptions describe the location or the time it occurred.
Heat stroke	Condition of collapse associated with an elevated body temperature, haemo-concentration and failure of body enzyme systems.
Hyperglycaemia	Raised blood sugar level
Hyperthermia	Body temperature increases to a high level; results in collapse, haemoconcentration and failure of body enzyme systems, fatal unless rapid cooling measures can be introduced.

Hypervolaemia	An increase in the volume of fluid in the circulation; may be produced by overenthusiastic fluid therapy.
Hypoglycaemia	Low blood sugar level
Hypothermia	Below normal body temperature
Hypoxia	Diminished blood oxygen leads to reduced availability of oxygen to the tissues, a state that must be guarded against during and after general anaesthesia.
Inflammation	A response by the tissues to any harmful stimulus, usually intended to limit the spread of the harm to the rest of the body and to protect the vital organs.
Inhalation pneumonia	Gastric contents or other semisolid substances that enter the trachea by accident and set up disease in the lungs; causes a difficult to treat pneumonia
Intussusception	Invagination of a length of small intestine into itself or possibly the large intestine
Laceration	A jagged wound
Lameness	Gait abnormality resulting in a lack of symmetry in the stride pattern, caused by pain or mechanical restrictions
Lesion	Any abnormality in the gross or microscopic appearance of body tissue resulting from a disease process
Moribund	Dying, usually without hope
Mucous membrane	Protective lining to the body cavities; some are ciliated to move the mucus along with waves of propulsion
Myiasis	Infection with fly maggots
Necrosis	Death of cells or tissue
Nystagmus	Unusual flicking movement of the eyeballs. Most easily recognised by using the ophthalmoscope to examine the fundus. May be caused by disorders by the parts of the brain controlling the eyesight and the balance.
Oedema	Excessive accumulation of fluid in the body, usually in the tissues and the body cavities
Palpation	Careful investigation using the hands
Palpate	Investigation by touch; a cornerstone of clinical examination
Paralysis	Complete loss of function of an area of the body; when applied to a limb, the term means that the animal is unable to make any stepping movements, even if aided.
PCV	Packed Cell Volume. The percentage of the circulating blood volume that is taken up by cells, as opposed to fluid. A raised PCV may indicate dehydration; a low PCV indicates shock, anaemia, excessive rehydration etc.

Peracute	(of a disease) very severe and of very short duration, generally proving quickly fatal.
Pneumonia	Inflammation of the lung tissue; causes include bacterial or viral infections, allergy, aspiration of gastric contents.
Pneumothorax	The presence of free air within the thoracic cavity; usually the result of trauma to the thoracic wall.
Polydipsia	Increased thirst: a common clinical sign and often associated with polyuria
Polyuria	Increased production of urine
Prognosis	The likely outcome of a disease
Pulmonary	Relating to the lungs
Pulmonary oedema	Inflammation of lung tissue, with build-up of oedema fluid within the alveoli.
Secondary	Indicates something that develops later
Seizure	General term used for an epileptic fit
Septicaemia	Condition where bacteria are multiplying in the bloodstream; toxins add to the problem
Shock	Profound physiological change in the body with circulatory collapse as the result of trauma, bacterial toxins or allergic response.
Stasis	Lack of flow, as with an intestine obstruction
Tachycardia	Elevated heart rate: common causes include pain, stress (adrenaline) hypotension and drugs such as atropine
Tachypnoea	Elevated respiratory rate: common causes include pain, shock, airway obstruction, effusions and pneumonia.
Toxic	Harmful, poisonous
Toxin	A poisonous substance, biological in origin
Tremor	Repetitive, involuntary movement
Triage	The action of prioritizing patients according to the severity of their injuries so that life-threatening conditions are treated before less-serious injuries.
Ulcer	A full thickness crater or erosion defect in the surface of the skin or mucous membrane, often surrounded by a zone of inflammation
Unconscious	A state of deep sleep-like unawareness of surroundings with reduced responses to external stimuli; often the result of a head injury or administration of anaesthetic agents.

Easy Reference Guide

Veterinary Aspects

The following information has been extracted from the main Sections of the Manual as an Easy Reference Guide.

Schedule classifications for drugs and poisons

The Health (Drugs and Poisons) Regulation 1996

Schedule	Description
Schedule 1	(This schedule is intentionally blank)
Schedule 2 Pharmacy Medicine	Substances, the safe use of which may require advice from a pharmacist, and which should be available from a pharmacy or, where a pharmacy service is not available, from a licensed person. Only available from a pharmacy, veterinary surgery or licensed person
Schedule 3 Pharmacist Only Medicine	Substances, the safe use of which requires professional advice, but which should be available to the public from a pharmacist (or veterinarian) without a prescription. Only sold by authorised persons including veterinarians.
Schedule 4 Prescription Only Medicine/ Prescription Animal Remedy	Substances, the use or supply of which should be by or on the order of persons permitted by State or Territory legislation to prescribe and should be available from a pharmacist (or veterinarian) on prescription only.
Schedule 5 Caution	Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.
Schedule 6 Poison	Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label.
Schedule 7 Dangerous Poison	Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special regulations restricting their availability, possession, storage or use may apply.
Schedule 8 Controlled Drug	Substances which should be available for use but require restriction of manufacture, supply, distribution, possession and use to reduce abuse, misuse and physical or psychological dependence. Substances with legitimate therapeutic uses, but which have addictive or abuse potential.
Schedule 9 Prohibited Substance	Substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities. Generally, have no therapeutic use, and are subject to abuse. Only available for research.

Different Types of Drugs and their Uses

Analgesic Relieves pain without affecting consciousness. Some may reduce level of alertness.

Antibiotic Inhibits the growth of or kills bacteria

Sedative Depresses the central nervous system and tends to cause reduced mental activity (also referred to as a tranquiliser)

General Anaesthetic Produces unconsciousness. Can be either injectable or inhalation.

Local Anaesthetic Produces localised analgesia of an area. Usually used for small, short procedures.

Anti-Inflammatories Relieves pain, swelling and fever caused by acute inflammation.

Euthanasia Drugs Drugs used to euthanise animals

Common Drugs used in Wildlife

Below is a schedule of drugs commonly used in Australian wildlife.

Antibiotics

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Betamox Amoxycillin 400 ®	4	Amoxycillin	Avian Mammal	Oral
Bactrim ® Septrin ®	4	Trimethoprim and Sulfamethoxazole	Avian Mammal Echidna Reptile	Oral
Trivetrin ®	4	Trimethoprim and Sulfamethoxazole	Mammal Reptile	Injection
Baytril ®	4	Enrofloxacin	Avian Reptile Amphibian Mammal Monotremes	Available in both oral or injectable forms
Clavulox ®	4	Clavulanic acid and Amoxycillin	Avian Mammal	Available in both oral and injectable forms
Fortum ®	4	Ceftazidine	Reptile Mammals Avian	Injectable

Anaesthetic / Sedatives

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Isoflurane	4	Isoflurane	All species	Gaseous inhalation
Alfaxan RTU CD ®	4	Alfaxalone	Mammals Reptiles	Injectable
Zoletil ®	4	Tiletamine and Zolazepam	Mammals	Injectable
Pamlin ®	4	Diazepam	Mammals	Injectable

Analgesics and Anti-Inflammatories

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Temgesic ®	8	Burpenorphine	Mammal Monotremes	Injectable
Torbugesic ®	8	Butorphanol	Avian Amphibian Reptile	Injectable
Methone ®	8	Methadone hydrochloride	Mammals Monotremes	Injectable
Panadol ®	2	Paracetamol	Mammals	Oral
Painstop (Daytime) ®	2	Paracetamol and Codeine	Mammals	Oral
Metacam ®	4	Meloxicam	Avian Amphibian Mammal Monotremes Reptile	Available in both oral and injectable forms
Rimadyl ®	4	Carprofen	Mammals Monotremes	Injectable
Solu-delta-cortef ®	4	Prednisolone sodium succinate	Mammals/ Koalas	Injectable

Anti-Fungal

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Nilstat ®	2	Nystatin	Avian Mammals	Oral
Amphotericin B	4	Amphotericin B	Mammals	Oral
Diflucan ®	4	Fluconazole	Mammals Birds Monotremes Reptiles	Oral or injectable
Daktarin ®	3	Miconazole nitrate	Mammals	Oral (oral gel) or topical (ointment)
Surolan ®	4	Miconazole nitrate, polymyxin B sulfate and prednisolone acetate	Mammals	Topical

Anti-Parasitic

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Avitrol Plus ®	5	Levamisole hydrochloride and Praziquantel	Avian	Oral
Baycox ®	5	Toltrazuril	Mammal Avian	Oral
Cydectin ®	5	Moxidectin	Avian Mammal	Available in both oral and injectable forms
Ivomec ®	5	Ivermectin	Reptiles (not turtles) Mammals	Available in both oral and injectable forms
Panacur ®	5	Fenbendazole	Reptiles Mammals	Oral

Anti-Psychotic

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Haloperidol ®	4	Haloperidol decanoate	Macropods	Injectable

Gastro-intestinal

Trade Name	Schedule	Active Ingredient	Species Most Commonly Used for	Most Common Route of Administration
Prepulsid ®	4	Cisapride	Koalas Mammals	Oral
Peptosyl ®	2	Bismuth sub-salicylate	Mammals	Oral
Tympanol ®	2	Acid dairy, spirit polyvinyl, tincture of bitter wormwood.	Mammals	Oral
Scourban ®	4	Sulfadimidine, Sulfadiazine and others	Mammals	Oral

Terminology

Wildlife rehabilitators should become familiar with common abbreviations often used by vets. Abbreviations are used in a variety of circumstances (e.g. Release paperwork and copies of veterinary records).

Listed below are some of the more common abbreviations used:-

Administering Medications

Abbreviation	Meaning	Abbreviation	Meaning
SID	Once daily	**PO or p.o.**	Orally (per os)
BID	Twice daily	**IM or i/m**	Intramuscular
TID	Three times daily	**SC or SQ or s/c**	Subcutaneous
QID	Four times daily	**IV or i/v**	Intravenous
qd	Every day (same as SID)	**ml**	Milli-litre
q8h	Every 8 hours	**q12h**	Every 12 hours

Physical Examination, Physiology

Abbreviation	Meaning
BAR	Bright, alert, responsive
BPM	Beats or breathes per minute
CRT	Capillary refill time
DOA	Dead on arrival
GI	Gastrointestinal
HBC or MVA	Hit by car / motor vehicle accident
HR	Heart rate
ICU	Intensive care unit
L (with a circle around it)	Left
R (with a circle around it)	Right
LOC	Level of consciousness
MM	Mucous membrane
NAD	No abnormalities detected
P	Pulse
PM	Post-mortem; or abbreviation for evening
R	Respirations
RR	Respiration rate
Stat	Immediately (statim)
TLC	Tender loving care
TPR	Temperature, pulse and respiration
URI	Upper respiratory infection

Abbreviation	Meaning
URT	Upper respiratory tract
WNL	Within normal limits
Wt	Weight
BW	Body weight
↑	Increased
↓	Decreased
+	Positive (used to describe test results) may have multiple +'s to indicate degree
-	Negative (used to describe test results) may have multiple –'s to indicate degree
<	Less than
>	Greater than
♂	Male
♀	Female
Bx	Biopsy
Dx	Diagnosis
Fx	Fracture
Hx	History
Rx	Prescription
Sx	Surgery
Tx	Treatment

Terms Used to Describe Direction

It is useful for wildlife rehabilitators to have an understanding of some of the commonly used terms used by veterinarians when describing direction on a body. This helps you understand veterinary notes describing injuries and wounds. Below is a list of commonly used terms and what they relate to.

Abbreviation	Meaning
Ventral	Refers to the belly or underside of a body or body part
Dorsal	Refers to the back
Cranial	Means towards the head
Caudal	Means towards the tail
Anterior	Means front of the body. Used more to describe organs or body parts.
Posterior	Means rear of the body
Rostral	Means nose end of the head
Caudal	Means towards the tail
Cephalic	Means pertaining to the head
Medial	Means toward midline
Lateral	Means away from the midline
Superior	Means uppermost, above, or toward the head
Inferior	Means lowermost, below, or toward the tail
Proximal	Means nearest midline or beginning of a structure
Distal	Means farthest from midline or beginning of a structure
Superficial	Means near the surface; also called external
Deep	Means away from the surface; also called internal
Palmar	Means bottom of the front foot or hoof
Plantar	Means bottom of the rear foot or hoof.

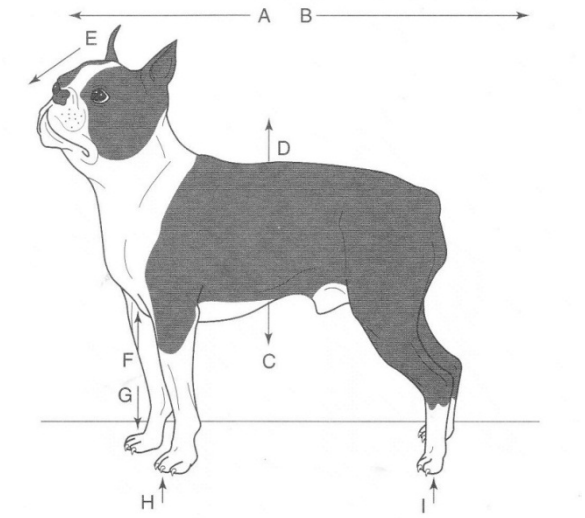


FIGURE 2–1 Directional terms. The arrows on this Boston terrier represent the following directional terms: A = cranial, B = caudal, C = ventral, D = dorsal, E = rostral, F = proximal, G = distal, H = palmar, I = plantar.

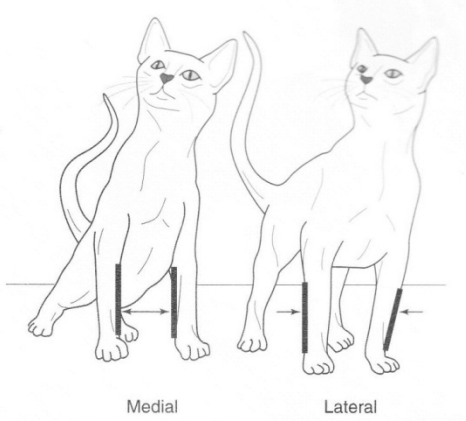


FIGURE 2–2 Medial versus lateral. The arrows on these cat represent the directional terms medial and lateral.

Source: *All Illustrated Guide to Veterinary Medical Terminology*

Anatomy and Physiology

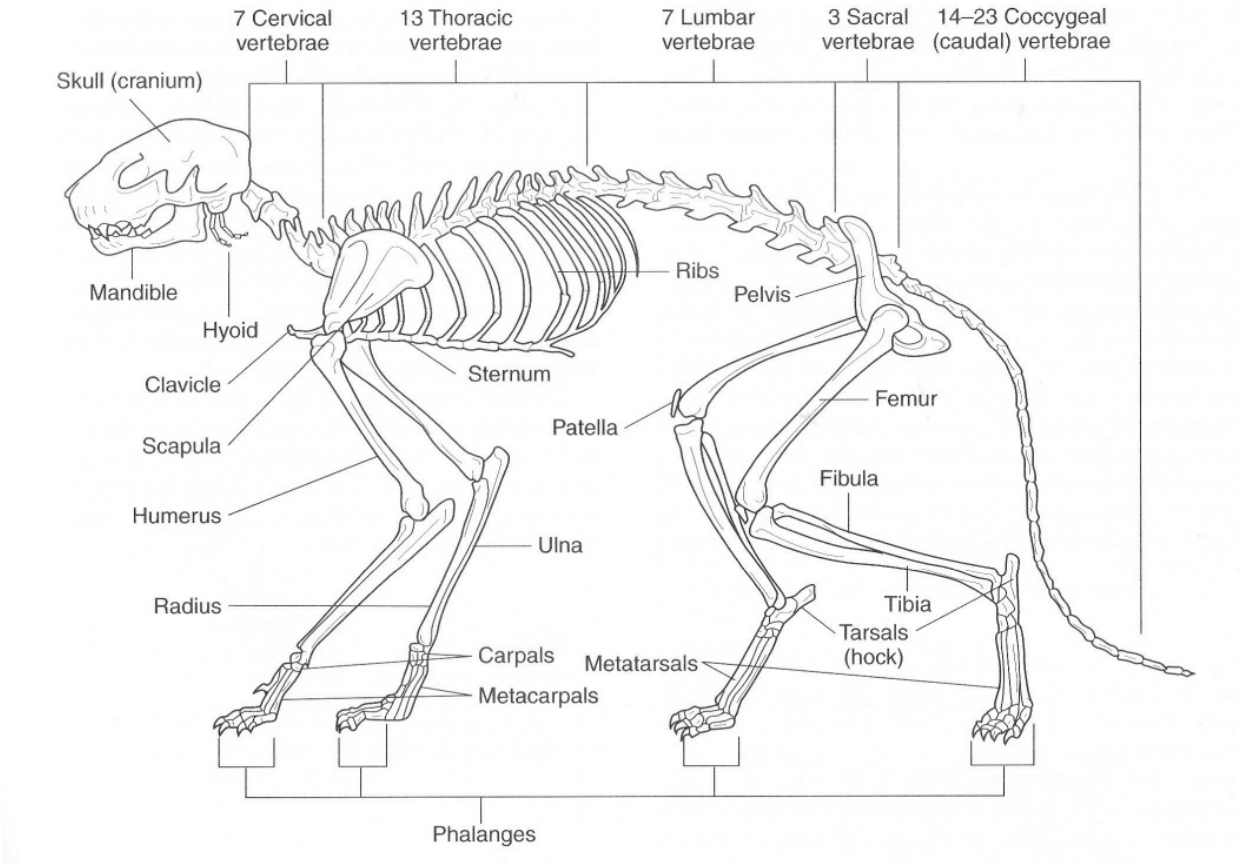
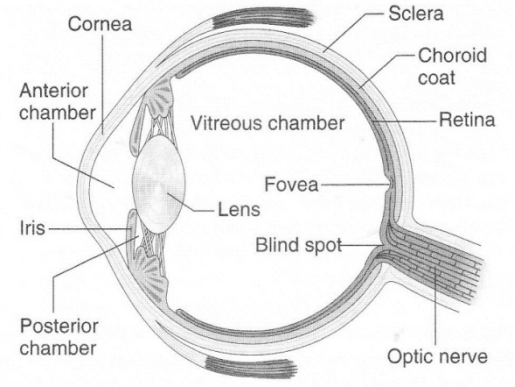


Diagram above indicates the skeletal structure of a cat which is very similar to many wildlife species. Rehabilitators should become familiar with basic anatomical definitions.

Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)



Chambers of the Eye

Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)

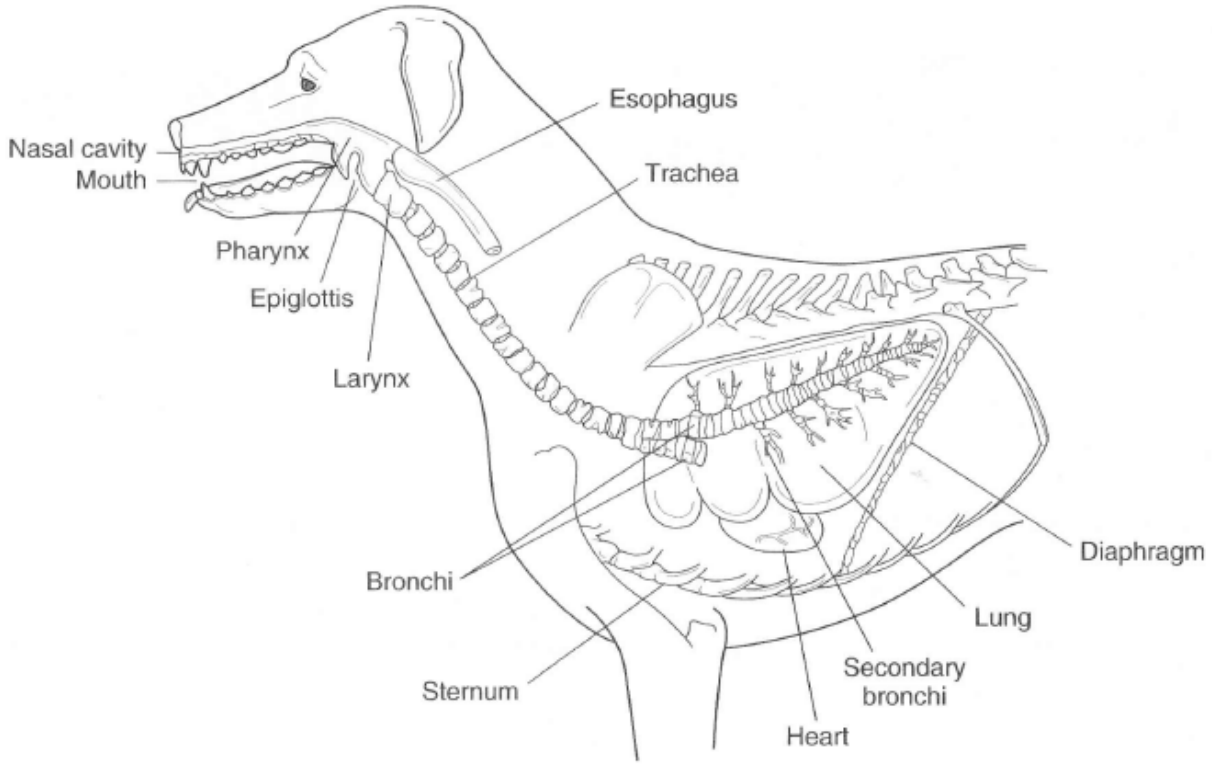
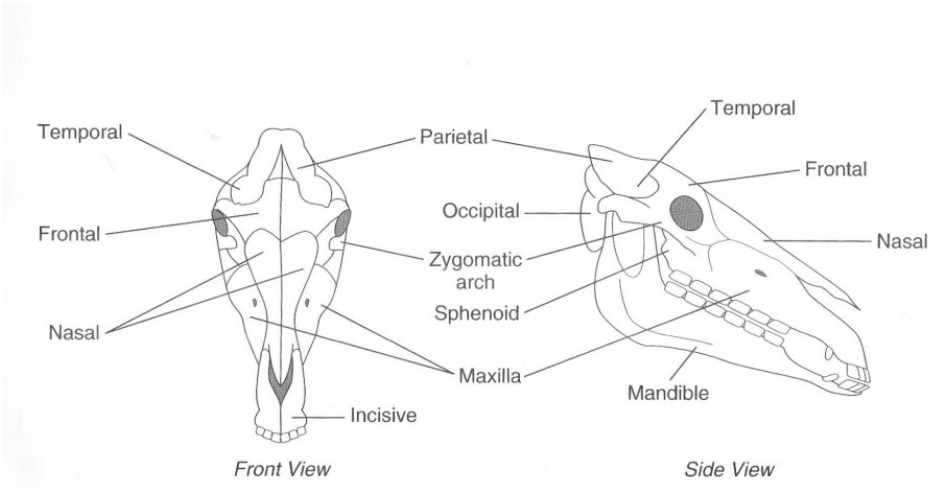


FIGURE 9–1 Structures of the respiratory system

Diagram: Respiratory system of mammals.
Source: An Illustrated Guide to Veterinary Medical Terminology (Romich)



Bones of the skull and face.
Source: An Illustrated Guide to Veterinary Medical Terminology

Fractures

The different types of fractures commonly seen in wildlife include:

Simple Fracture – where the bone has been broken cleanly into 2 pieces
Multiple (or comminuted) Fracture – where the bone has been broken in a number of places.
Compound (or open) Fracture – where the bone has been fractured and has punctured the skin.
Complicated Fracture – includes damage to organs or other structures around the fracture site
Greenstick fracture – where the fracture does not pass through the bone
Pathological fracture – where a fracture occurs due to disease affecting/damaging the bone

Terminology used to describe the location of the fracture:

Proximal – that part of the bone nearest to the body
Distal – that part of the bone farthest from the body
Mid Shaft – a fracture more or less in the centre of a long bone
Physeal – a fracture through the growth plate of an immature animal (particularly common in macropods)
Diaphyseal – a fracture of the diaphysis or mid shaft of the bone
Ephiphyseal – a fracture of the epiphysis
Condylar – a fracture of the epiphysis when condyles are involved