Avian wildlife first aid and stabilisation

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One of the most common reasons avian wildlife is brought into a veterinary clinic is trauma. Traumatic events include injuries derived from window strike, motor vehicle accidents, predator attacks, hitting fencing and trap injuries.

Each veterinary hospital in New Zealand has to decide on its policy for treating wildlife. There is an obligation for veterinarians to either treat or humanely euthanase injured wildlife under the Animal Welfare Act. A Department of Conservation permit is not required to treat wildlife while under veterinary care, but equally, no one will pay to look after the wildlife. So when presented with an injured wildlife patient how do you triage who to treat? Some points to consider when deciding to treat wildlife can include: the species conservation importance, impacts on individual animal welfare, opportunities to educate the public and opportunities to benefit from learning experiences. Some of New Zealand's wildlife is rare and every effort may be needed to ensure the species survival through individual treatment whereas common species may not be of conservation significance but may improve your bird care and skills through experience.

Other important points to consider before treating injured wildlife are: the long term ramifications, for example:

- Can the bird be released successfully as a functioning member of the species or will captive placement be needed or available?
- What is the extent of the injury and expected prognosis?
- Are there post-injury complications such as arthritis?
- What is the cost of treatment?
- Is there experience and facilities available and someone to rehabilitate the bird?

Some of these questions are able to be answered before you have assessed the bird but some may depend on further diagnostics. What is important is that these questions are thought of and addressed at the beginning of treatment and not after weeks of time, effort and resources have been put into treating a wild patient.

Stabilisation of avian wildlife is similar to generic critical care of any animal however with wild birds you may need to stage your exams and diagnostics so as not to stress the bird too much. When dealing with wildlife it is vital that you have a clear plan for what you are going to do and have as much pre-pared as possible. This can cut down on handing and exam time significantly and help to minimise stress.

Initial assessment

Taking a complete history is important when admitting or assessing any animal; however wildlife often comes with little to no history at all. Therefore is it really important to gather as much information from the submitter as possible, but you may have to prompt with the right questions:

- Where was the birds found? This information can be used when it is time to release the bird.
- What was it doing? Generally if a wild bird has been captured there is something wrong but it can be useful to know of any abnormal behaviour before intervention, ataxia for example. A distance exam isn't generally possible in the first instance with wildlife in a hospital setting.
- How and when was it captured?
- Was there anything to note in the environment? Knowledge of dogs nearby, traffic, people can be useful in gauging what has happened to your patient.
- What treatment, food or medication has it been given? Often rehabilitators will medicate birds that have been attacked by cats or dogs with antibiotics or give pain relief and fluids but not necessarily under advice from a veterinarian.

Generally the next step is a distance exam however wildlife is often in a cardboard box or wrapped up and handed to the clinician so a distance exam at this point is generally not possible or diagnostic due to fear or preservation responses.

Physical exam

This exam should be performed by a veterinarian where possible and done as quickly and methodically as possible. This exam should also be combined with the stabilisation of the patient, so preparation of pain medication, bandaging, fluids and a cage or incubator will quicken the process markedly and help minimise stress.

Handling

If a wild bird has been caught it is safe to assume it is debilitated. It may be suffering from starvation, dehydration, exhaustion and trauma therefore we need to restrain gently but effectively. Birds also have airsacs and require free movement over the chest and abdomen to breath, so when handling restraint must allow for breathing. If you come across a bird you have not handled before take a moment to consider what the dangerous parts are and how best to restrain them. A raptor for example has talons that are sharp and strong, therefore restraint at the hocks is important to immobilise the feet and keep the handler and examiner safe.

Seabirds and waders

Some seabirds and waders have long, sharp beaks that can be used as weapons. Shags and herons, for example, have deceptively long necks that they pull in and then stretch out very quickly, often lunging for your eyes. Be wary of **sharp pointed beaks** and protect your eyes when handling these birds. Safety glasses are preferable, but prescription glasses will provide some protection.

To restrain a large seabird, e.g. albatross, throw a towel over the entire bird, grasping their head in one hand (making sure you don't cover the nostrils). Enclosing their wings with the towel, pick the bird up around the body, holding it under one arm while still holding onto the beak with your other hand. This may require two people.

Smaller seabirds, e.g. petrels, can be handled using the waterfowl technique with a hand around each side of the body enclosing the wings.

NB: Some birds, like gannets, do not have external nostrils. Instead, they breathe through a narrow gap between the end of the upper and lower beak. For this reason, you must allow the beak to open a little during restraint.

Small waders such as stilts and oystercatchers have particularly long thin and potentially fragile legs, so handle these with care. Position yourself between the bird and the water during initial capture, and encompass the body and wings with a lightweight towel from above. You can easily enclose the body with both hands, leaving the legs dangling between the last two fingers, without placing pressure on the chest. Do not attempt to restrain the legs unless absolutely necessary.

Penguins

Little blue penguins can be picked up with one hand under each flipper. They can be restrained with a towel and one hand around the body and flippers, the other hand under the feet, pressing the bird against your chest. They seem to prefer to have their feet supported.

With larger penguins, it is necessary to first restrain the head with one hand. Once the head is under control, the flippers should be restrained (a towel works well) as the body of the bird is picked up with your free arm (similar to the technique used for large seabirds). Keep hold of the head at all times. Holding penguins (or any bird) upside down by their feet is not encouraged!

Figure 1. Left to right: Handling techniques for raptors, passarines and small waders, kiwi

Waterfowl

Ducks will flap their wings and nip with their beaks, but cause little damage to handlers. Hold their wings close to their body to stop them flapping. Large waterfowl are surprisingly strong and can create a lot of force flapping their wings. Birds with long necks, such as swans, need to be restrained around the body and by the neck (close to the head) or head (similar to a large seabird).

Raptors

Raptor feet can be very dangerous. The main defence in these birds are their talons. Juvenile harriers, falcon and morepork may also attempt to bite. Adult harriers however are less likely to bite.

In general, these birds will attempt to get away by turning their back to you, whether in a cage situation or on the side of the road. Use a towel or something similar to cover the birds' body, and gently but firmly push down so that the legs are pinned under the body. Using one hand, and with the bird facing away from you, reach behind and under the bird to grasp hold of both hocks. Keep hold of the legs firmly! Use the other hand to hold the wings in to the body with the towel over the head.

Sometimes a cornered bird will flip onto its back lashing out with its feet. Use a thick towel to distract the bird, allowing it to grab hold of the towel with its feet instead of you. Once its feet are busy, place another towel over its head and body so that it cannot see – this tends to quiet them down while you position them for safer restraint.

Another technique is to approach it from behind, grasp it firmly by the back of the head with one hand and use your other hand to hold the legs (and wings) firmly between its ankle and the foot.

Small passerines and honeyeaters

Small passerines such as robins and tomtits, are delicate and must be handled with care. They can be held in the palm of your hand facing outwards, with the head gently restrained between the first two fingers.

Remember not to hold these little birds too tight!

Honeyeaters such as tui have sharp claws that may hurt when they grab hold of you, but rarely cause any severe damage. Using a light cloth (tea towel) around the body restricts flapping of the wings, thus preventing damage to the plumage. Usually you can pick them up using one hand over the back and around the chest.

Parrots

Psittacines have strong beaks that can inflict a lot of damage. The most important thing to remember in restraining a parrot is to control the beak. Grasp the bird with a towel, and restrain its head with your forefinger and thumb around each side of the lower jaw. For large parrots, use your other hand to restrain the body. To restrain a small parrot such as a kakariki, hold the head between the thumb and forefinger (facing outward) and the body/wings cupped in your palm.

Kereru

The more struggling that occurs in capturing native pigeons, the more likely these birds are to 'drop' flight feathers. This greatly prolongs rehabilitation. Capturing these birds requires speed and efficiency. As a defence mechanism, kereru will flap their wings, deliberately hitting their 'attacker' with the carpus (wrist). These birds also have very sharp claws. Using a light towel, grasp the bird around the body, encasing the wings, as in the waterfowl hold. Allow the bird to grip the towel with its feet.

Kiwi

Kiwi use their strong legs and claws as a defence mechanism. Both legs need to be firmly restrained. They should not be held dangling by their legs. Using one hand, grasp both legs at the level of the hocks with a finger between the hocks to prevent rubbing. Supporting the body, the bird should then be picked up and held close into your body with the head tucked into your armpit. Legs should not be restrained with tape for more than short periods of time as this can cause severe muscle and potentially kidney damage.

Takahe and pukeko

These birds can use both their beak and their feet in defence. Both the head and legs need to be restrained. A combination of the kiwi leg hold and parrot head hold is used. The wings can be controlled with a towel and then tuck the bird into your body.

In general, use a towel as it will decrease the need to over-handle the bird and help keep wings in. Restrain the dangerous part and ask for help if needed.

Physical exam

A physical examination of the patient is necessary to establish any obvious injuries.

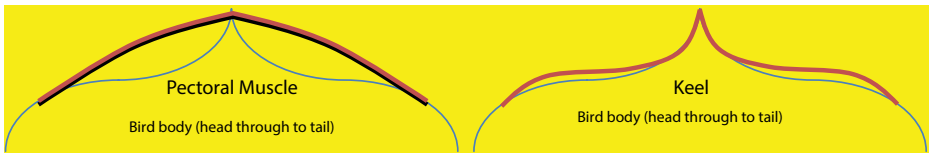

Figure 2. Diagram showing a superior view of an avian chest and the difference in muscle mass for body scoring. Left Normal musculature of healthy bird BS 3/5
b) Musclular atrophy and prominent keel BS 1/5.

- **Pectoral muscles** – the size of these chest muscles gives a good indication of body condition and general health status. The muscles should be level with the keel. If the bird is sick but in good body condition, this may indicate recent illness (e.g. trauma), as opposed to a chronically ill bird in poor body condition.
- **Oral cavity** – look for wounds, infections (often cream-coloured plaques), mucous membrane colour, and blockages in the choanal slit in the roof of the mouth.
- **Closer inspection of eyes/nostrils/ears/beak** – bleeding, parasites, injuries.
- **Wings** – flex and extend each wing joint and palpate for any instability.
- **Legs/feet** – as for the wings, flex and extend each joint and palpate for swellings or pain.
- **Feathers/skin** – check for damage, blood, lice and mites. Very sick birds will tend to have a lot of lice on them. Birds have very thin skin that seals over quickly, and often minor looking wounds can be more severe than they look. Feathers can also be good indicators as to the length of time a bird has been grounded or where injuries are on the bird with clumping from saliva or blood.
- **Vent** – this is the entrance to the cloaca where faeces and urine/urates are passed from. It should be clean. A dirty vent can indicate that the bird has been down for a while or has diarrhoea.
- **Droppings** – waste material passes out the vent via the cloaca, the opening for the gastrointestinal, reproductive and urinary tracts. A normal bird dropping usually consists of a white paste (urates, produced in the kidneys), a clear colourless to pale-yellow urine (should be a very small amount), and a darker faecal component. The consistency and colour of the faecal component depends on the diet of the bird. Nectivorous birds (feed on nectar), because of their largely liquid diet, have very liquid droppings with the faecal component varying from green to brown. Granivorous birds (feed on seed/grain) have much more solid droppings with a definite white urate component and a reasonably solid dark brown faecal component. Meat eating birds tend to have a larger white urate component to their droppings with a brown coloured, often strong-smelling faecal component. Stress induced droppings are usually very watery and will occur for a certain period of time directly after capture of a wild bird.
- **Weight** – obtaining a weight at this point will allow for accurate dose calculations. It will also serve as a starting off point for weight recordings which is a very good indicator if a bird is getting enough nutrition while in care or handling the stress of hospitalisation.

Once complete the bird will need to be stabilised. It is assumed that all wildlife patients will be hypothermic, dehydrated, malnourished and may be in pain. Initial first aid treatment is aimed at attempting to rectify these problems.

Stabilisation

Pain medication

It should be assumed that any injury that would cause people pain would cause a bird pain. Pain can be difficult to assess in avian wildlife as different species can react differently to capture and handling, for an example, blue penguins will bite and hit with their flippers and protest to an examination where as a harrier is likely to freeze and become unresponsive to stimuli. Birds also have a preservation reflex. This is an adaptation to survival in the wild so as not to look vulnerable to predators.

Opioids (Butorphanol) and non steroidal anti inflammatory drugs (NSAIDs) can both be used in avian patients to help manage pain. Typically opioids are used in the first instance via intramuscular injection into the pectoral muscles and NSAIDs after rehydration has occurred. This is due to the strain NSAIDs can place on kidneys and as most wildlife will be dehydrated they will be at greater risk of kidney damage.

Butorphanol is given IM/IV at 4mg/kg BID.

Meloxicam is given at 0.5–1mg/kg PO BID with concurrent fluid therapy.

Bandaging

Bandaging is another important tool for reducing pain and stabilising fractures. Supporting fractured limbs with bandages will also help to maintain vascular and nervous supply to damaged tissue.

Any open wounds must be covered with a sterile dressing before further bandaging is applied.

It is necessary to immobilise the joint above and below the fracture to provide effective stabilisation. Typically there are following bandaging styles:

Figure-of- 8 bandage

This bandage consists of a self-adhesive tertiary layer bandage (e.g. 'Coflex' or 'Vetrap') in a figure-of-8 pattern. On occasions, a layer of a soft padding material under the Vetrap/ Coflex may be useful.

This bandage is useful in the following injuries:

- Wing fractures below the elbow
  - Most closed fractures of the ulna and radius when the fragments are well aligned
  - Fracture of the metacarpal bones
  - In very small or young birds
  - After orthopaedic surgery of the wing
- Dislocation of the elbow or carpal joint
- Wounds in these areas (need to cover the wound with a primary dressing first)

This bandage is not useful for fractures above the elbow if not used in conjunction with a body wrap bandage.

Rules of the figure-of-8 bandage:

- Incorporate the tertiary covert feathers
- Apply as high in the axillary ('armpit') region as possible to prevent slippage below the elbow
- Don't apply too tightly
- Don't make it too bulky as this will cause balance problems

Figure 3. Left to right: Placement of a figure-8 bandage on a kereru

Wing-to-body bandage

This bandage is useful to stabilise fractures of the humerus, coracoid, clavicle and scapula, and it is recommended to combine with the figure-of-8 bandage. It consists of self-adhesive bandaging wrapped right around the body, immobilising the wing and the shoulder.

Figure 4. Left to right: Process of placing a wing to body bandage

Rules of the wing-to-body wrap:

- The bandage should be halfway between the top and bottom of the keel
- Be careful not to include the legs and vent
- The bandage needs to be tight enough to stop wing movement and to prevent the bird getting it's feet entangled, yet without compromising breathing.

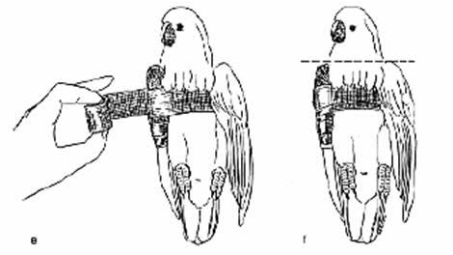

Figure 5. Wing-body wrap. This immobilises the wing and shoulder. Diagram reproduced from Avian Medicine: Principles and Application, Ritchie BW, Harrison GJ, Harrison LR, eds. Wingers Publishing Inc, Lake Worth, Florida, 1994.

Modified Robert Jones bandage

This bandage is useful in immobilising simple fractures of the lower tibiotarsus and tarsometatarsus, as well as hock injuries and soft tissue wounds to the tibiotarsus and metatarsus. It is not really useful for injuries of the upper tibiotarsus or femur as effective immobilisation of the hip joint cannot be obtained. In these cases provide a small

enclosure to limit movement until surgical stabilisation can be performed.

A thick layer of 'Softban' is applied from the top of the foot up, and this is covered by conforming gauze and then 'Coflex' or 'Vetrap'. The toes need to be continually monitored for swelling or discolouration.

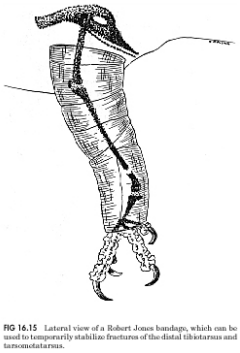

FIG 16.15 Lateral view of a Robert Jones bandage, which can be used to temporarily stabilize fractures of the distal tibiotarsus and tarsometatarsus.

Figure 6. Lateral (side) view of the Robert Jones bandage. Diagram reproduced from Avian Medicine: Principles and Application, Ritchie BW, Harrison GJ, Harrison LR, eds. Wingers Publishing Inc, Lake Worth, Florida, 1994.

Figure 7. Modified Robert Jones bandage on a harrier. Note the flexed position of the leg and the incorporation of the knee

Ball bandages or jandals

These are bandages of the feet that are useful in cases of bumblefoot, toe fractures or soft tissue injuries of toes or feet of perching birds.

Gauze swabs or cotton wool balls are places on the bottom surface of the foot, and these are covered by self-adhesive bandaging material ('Vetrap', 'Coflex').

These should be applied so as to allow the bird to stand, and shouldn't be too tight around the top in case the blood supply is compromised. The provision of a padded surface is necessary for these birds.

Birds with flat feet, e.g. seabirds, waterfowl, need a slightly different foot bandage. 'Jandals' made from closed-cell foam can be cut to shape and bandaged on to provide soft padding underfoot. These need to be changed and the feet checked regularly.

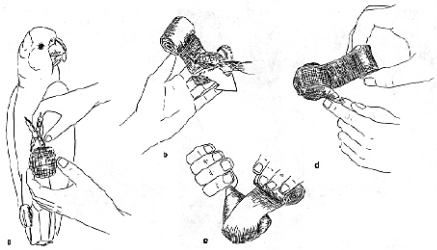

Figure 8. Ball bandages can be used to protect foot injuries while they heal. Diagram reproduced from Avian Medicine: Principles and Application, Ritchie BW, Harrison GJ, Harrison LR, eds. Wingers Publishing Inc, Lake Worth, Florida, 1994

Figure 9. Jandals on a petrel

Fluids

It is assumed that all wildlife is dehydrated. This may be due to fluid loss, such as blood but also due to a prolonged time between the injury occurring and being found. Signs of dehydration in birds include tacky wrinkled skin (test the skin above the eye) and sunken dull eyes. However, it is safest to assume that all sick or injured birds are up to 10% dehydrated. A simple method of establishing the fluid needs for any sized bird is to calculate using bodyweight as a guide.

Replacement: Assume all birds have lost 10% of their bodyweight to dehydration. This equates to 100ml of fluids per 1kg of bodyweight. Replacement of half of the calculated lost fluid should be given over the first 12–24 hours, and the rest given during the following 48 hours.

Maintenance: In addition to replacing lost fluids, maintenance fluids need to be provided. These are the normal day-to-day fluid requirements of the bird. Maintenance fluids should be given at 50ml/kg bodyweight per day.

Oral fluids are often the simplest method of fluid administration. Use Hartmann's solution (with or without glucose), or an oral electrolyte solution ('Polyaid', 'Vytrate' etc.). Oral administration should not be used if a bird is unable to hold its head up on its own as inhalation of the fluid into the respiratory tract (aspiration) can cause

asphyxiation. The volume administered by this method is limited in birds without a crop or without a large proventriculus or gizzard.

Crop feeding (or tube feeding) involves passage of a tube down the oesophagus into the crop, or proventriculus/gizzard in those birds without a crop. It allows the direct delivery of food and fluids, reducing the risk of aspiration.

The type of tube used will depend on the bird you are feeding. A metal, round-ended crop needle should be used in parrots as their strong beaks can chew through plastic or rubber tubing. A tube, plastic or preferably silicon/rubber, can be used in birds that are unable to bite through it.

With the head well restrained, pass the tube beside the tongue on either the left or right side of the oral cavity, avoiding the glottis (opening to the trachea) then down the oesophagus. In many species (e.g. harrier, kereru), the glottis is very visible if the mouth is opened wide enough. However, the large muscular tongue of parrots limits visibility of the glottis. It is thus worthwhile checking that the tube is in the right place by feeling for both the cartilaginous trachea and the metal or plastic tube within the oesophagus. These can be palpated over the neck. Identifying both these solid structures independent of each other is confirmation that the tube is in the oesophagus and not down the trachea).

If at all unsure where the tube is, gently withdraw and try again. When you are confident the tube is in the oesophagus, slowly syringe the fluid in. Watch the back of the mouth for any fluid welling up or reflux. If this happens, remove the crop tube and allow the bird to swallow. It is recommended that inexperienced operators have crop feeding demonstrated to them before attempting it themselves.

Figure 10. Left: The glottis position at the base of the tongue. Right: The administration of oral fluids while controlling the head.

Subcutaneous (SQ) fluids are useful when the oral route of administration is not a safe method of giving fluids, or when larger volumes are required.

Injection of subcutaneous fluids involves passing a hypodermic needle under the skin and injecting fluids. Fluids should be warmed to body temperature (approximately 40°C), and the temperature can be checked on the inside of your wrist. Always use a new needle and syringe – sterility is important. The gauge of needle used will depend on the volume of fluids being given and size of bird. For smaller birds (50–300g) a 25G needle would be adequate, and for larger birds a 22G needle. Butterfly catheters are useful as they allow some movement of the bird while being given SQ fluids. The fluids need to be given in an area where there is loose skin to accommodate the volume. These include the

inguinal fold and between the shoulders. The total volume of fluids may need to be given in several sites. It is recommended to give no more than 10ml/kg body weight of fluids per site.

Intravenous or intraosseus fluids

Intravenous (IV) catheters to allow fluid administration can be placed into the medial metatarsal vein of the leg or alternatively into the brachial vein of the wing, or even the jugular as a last resort. This can be maintained for up to one week. Daily flushing with heparinised saline will help maintain viability. For birds that are likely to chew at or remove the catheter a rear facing cone (made from x-ray film) can be used to protect the IV catheter.

In general a 24G catheter can be used for most birds 200–1500g. Smaller or larger birds will require smaller (26G) or larger (22G) gauge catheters.

Figure 11. IV placement in the medial metatarsal vein in a kiwi.

Intraosseus (IO) fluid administration involves the placement of a catheter directly into the bone marrow. This allows for rapid rehydration in severely shocked patients with very low blood pressure that doesn't allow for intravenous catheter placement. Fluids cannot be given into the humerus or femur as these are pneumatic bones and in direct contact with the air sacs.

This should only be done under an anaesthetic as it is painful. A butterfly catheter can be used and sutured into place.

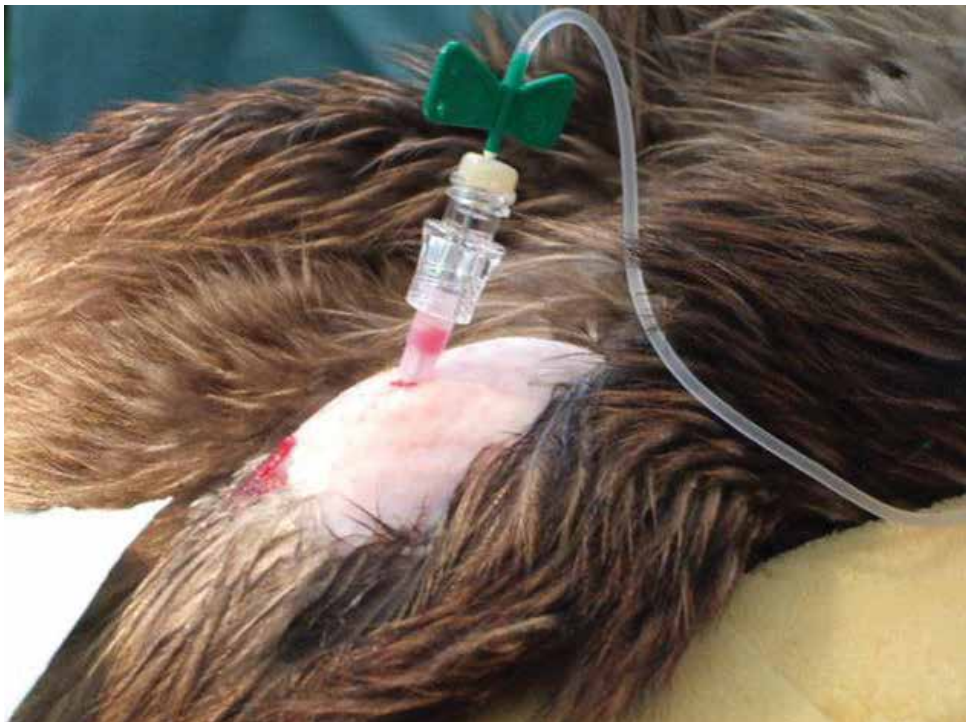

Figure 12. IO placement in a kiwi tibiotarsus

Hartmann's solution (LRS) with 2.5% glucose is most suitable in the initial stabilisation stage, however glucose should not be used subcutaneously.

Nutrition

When animals are not eating they are using up their reserves of fat and protein. Smaller birds that go without food for 24 hours may exhaust their reserves and die from starvation. Nectivores, such as Tui, have extremely fast metabolisms and can become dangerously hypoglycaemic within hours. Debilitated birds may require supplementary feeding by crop tube until they are eating on their own.

Emergency diets

Nectivores – use honey dissolved in boiling water.

Frugivores – offer vegetables or fruits such as berries, peas, corn and carrots (frozen vegetables and fruits are easily kept and great to have on hand) and crop tube hand rearing diet or recovery diet, both of which are parrot formulas.

Grainivores – offer seed and fruit or vegetables (whatever's left in your lunch box) and crop tube hand rearing diet or recovery diet both of which are parrot formulas.

Carnivores and Piscivores – Hill's AD diet mixed with a little saline to tube feed.

Short term diets (one or two days) are only suitable as emergency diets as they are not balanced. For medium term diet information contact Pauline at Wildbase.

Warmth

Injured or sick birds are unable to maintain their core body temperature. It is necessary to provide an ambient temperature range between 28–30°C.

A paediatric (human) incubator is ideal as it allows for both temperature and humidity control. However, these are often not available, and heat can be provided using a hot water bottle (these will need to be refilled regularly), circulating warm water blankets and by heating a room with air conditioning, small fan heater or oil heater. Temperature should be monitored using a maximum-minimum thermometer in the enclosure, and fluctuations in temperature should be avoided. Do not place a heat source directly on an immobile bird as they can very quickly overheat or suffer thermal burns. Birds should be monitored for signs of heat stress (hyperthermia), including panting and holding the wings out from the body. The ideal temperature for debilitated birds is 27–29°C. Some birds, such as adult kiwi and sea birds will require a lower temp of 25–27°C as they are quick to over-heat.

It is also important to maintain humidity. This is easily provided by placing a dish of water in the enclosure close to the heat source. The dish may need to be elevated or made inaccessible so the bird doesn't sit in it.

Cage or enclosure

A standard hospital cage will do for most species of birds not requiring an incubator. The room should be around 24°C and be as quiet as possible to reduce stress from noise and disturbances. A towel can be placed over the front of the cage to provide a visual barrier. The bedding should be a layer of newspaper with a towel over top. This will help keep the environment as dry as possible as birds do defecate many times in a single hour. Padding, such as a thick vetbed, should be added for those that are recumbent and unable to perch. This will not only provide comfort but also aid in the prevention of keel sores.

Perches can be offered to those able to perch. Adding padding such as softban and vetwrap/cohesive bandaging can soften perches and provide grip. If perching material is not available then a tree branch can be cut to size, covered and used.

Disturbances should be kept to a minimum with wildlife.

Summary

Once the bird is stabilised further diagnostic testing can be carried out and a plan for the patient made.

New Zealand wildlife is under threat, from people, predators and pollution of the environment. New Zealand's primary wildlife consists of birds and we can all help them by providing excellent veterinary care: whether that is full treatment and a second chance at life or euthanasia. We can educate our clients on the effects of introduced species and the small changes they can make themselves, like placing decals on windows to prevent window strike, to make a big difference to our precious national icons and wildlife.

References

Morgan K, Green C, Youl J, White BJ. Avian First Aid Course, Massey University, 2006