Avian nursing
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‘How do you nurse an avian patient’? is often a question that I have been asked during my time as a veterinary nurse who enjoys looking after the patients of the feathered variety. I find it a very challenging and satisfying part of being a veterinary nurse for exotics, with always more information to learn as the avian species can be very different from each other.

For those of you who have not had a huge amount of experience with dealing with an avian patient and in a country where there are so many fascinating birds, I thought I would do a presentation on how to do the basics.

Avian handling and restraint

Before restraining an avian patient, there are a few points which should be considered first:-

- Is the patient aggressive and/or frightened and therefore is injury to staff a problem?
- Is the bird in respiratory distress, and therefore is the stress of handling going to exacerbate this?
- Is the bird easily accessible allowing a quick, stress-free and safe capture?
- Is there any medication or examination required?
- Is there any injuries, i.e. fractures?

Stress can be reduced prior to being restrained by the following methods:-

- Turning the lights down in the room has a calming effect
- Hoods may be used in some raptors like falcons
- Owls are nocturnal, so turning lights of will not have a calming affect
- Keeping the noise down to a minimum
- Removing items from the cage or box before catching
- Prepare any medication or equipment before capturing the patient
- Be confident and quick when catching a bird

The dangers when handling birds are:-

- There is no diaphragm, they rely on the outward movement of their ribcage for inspiration
• As mentioned before stress is a major factor

• The main weapon in parrots is the beak and a powerful bite

• The main hazards with raptors are the feet, which of course tend to have powerful talons attached

• Some birds like kiwi and pukeko have powerful feet, and birds like takahe have powerful claws and beak so watch out!

• Damaging feathers, especially raptors

**Catching parrots using a towel:-**

• Move any equipment which may be in the way

• Select a towel, not too big or thick, you need to be able to feel your patient

• Open the towel to a suitable size, and drape 1/3 of the towel over one hand

• Approach the parrot preferably from behind and grasp the head first, with fingers either side of the mandible and around the neck

• Use the other hand to wrap the towel around the body and remove feet from cage bars

• Bring the parrot out of the cage still in towel

**Catching raptors using a towel:-**

• Again remove any equipment and bowls

• Select a towel as before

• Open the towel to a suitable size, and drape 1/3 of the towel over both hands

• Approach the raptor preferably from behind, this time go for around the wings and shoulders, using your 4th and 5th fingers to hold the thighs of the raptor

• The top of the towel can then be placed over the head, to help calm the patient

• Bring the raptor towards your body with its back towards you

• Then alter your grip so that the legs are held using the three fingered hold with one hand, and the other hand can support the head from the front just under the chin

**WITH BOTH CASES YOU SHOULD BE QUICK AND CONFIDENT!!!**

**TAKE CARE NOT TO DAMAGE THE FEATHERS, TAIL GUARDS SHOULD BE USED WITH ALL RAPTORS!!**

**WINGS CAN FRACTURE IF CAUGHT BETWEEN THE CAGE BARS!!**
Different species have different behaviour

• Falcons for example are generally more lively

• Wild Harriers tend may lay down on their chest with mouth open, in an attempt to disguise themselves as dead

• Harris hawks are one of the most intelligent and therefore learn very quickly how we catch them

• Some parrots for example can be very aggressive when threatened

• Some parrots can also panic a lot and try to get away

• Parrots can go quiet after tube feeding

• Wildlife generally become more stressed than pet birds

• Sea birds like Shags often go for shiny objects like eyes

Avian husbandry techniques

Cages for aviary birds from Macaws to Canary’s and Sparrows etc.

• the bird should be able to stretch its wings in all three directions at a bare minimum

• cages coated in plastic which may be chewed off should be avoided

• cages which have poor metallic finish should also be avoided as they can cause a risk of zinc poisoning

• small door can make capturing difficult and should be avoided

• cages should be made of stainless steel, as this is non toxic and is easy to clean

Perches and other cage furniture for parrots

• perches should be of differing diameter, so provides exercise for the feed and prevents pressure sores

• plastic perches are best used in hospital as these are easily disinfected, but make sure they are tough plastic which are not going to be chewed.

• Hardwood may be used but should be thoroughly disinfected

• concrete perches should not be used, as some parrots may chew them

• sandpaper perches should not be used, it causes foot abrasions

• perches should not be positioned to allow fouling in the water or on other perches
• food and water bowls should not be metallic

• sawdust, shavings or bark chips should not be used. This can harbour bacteria and fungi and can also contribute towards respiratory problems.

• newspaper, kitchen towel are preferred

• toys should be provided for birds such as parrots, or even rolled up bits of newspaper or cardboard may be used

• any toys which are not meant for birds or have parts which may be eaten or feet may get caught in should be avoided, such as human mirrors, chains and bells with clappers in them, some household plants may also be toxic.

• whole fruit and vegetables, such as apples, pears, broccoli, carrots etc. can be offered

• pine cones and hardwood cleaned branches can be offered

• the paper parrot toys are good to offer this allows the parrot to rip it to pieces safely

Kennels in hospital for raptors

• The kennels should have enough space to allow the wings to stretch out in all directions

• the kennel should be darkened by a towel over the front for example, this will keep the raptor calm

• is best to have solid sides to avoid wings and feet becoming caught

Perches for raptors

• Block perch, mainly used for falcons.

• Bow perch, mainly used for hawks and eagles.

• Raptors may be tethered to their perch by the leash, which is attached to the jess via a swivel.

Points to remember about hospitalising avian patients

• Zoonotic diseases such as Chlamydiosis

• Transmission of contagious diseases

• Stress, may also lead to disease, e.g. aspergillosis

• Potential harmful substances

Anaesthesia and analgesia
Induction of anaesthesia

- Isoflurane is the gaseous anaesthetic of choice
- Sevoflurane is available, but is expensive
- Ketamine combination are rarely used, as normally is given IM, therefore take up to 10 minutes to take effect and also prolongs recovery
- Un cuffed E T tubes (as they have complete tracheal rings) should be used wherever possible during anaesthesia
- Heat pads may be used, but care must be taken not to over heat the patient as this can be as much a danger and patients becoming too cold, bear huggers would be better.
- A modified Ayres T piece should be adequate for most avian anaesthesia

Monitoring anaesthesia

- Monitoring of anaesthesia is crucial; the depth should be just adequate to perform the procedure required.
- Planes 1 and 2, respiratory rate will be shallow and erratic, the patient will be lethargic and have drooping eyelids, lowered head and ruffled feathers.
- As depth increases, palpebral, corneal, pedal and cere reflex will remain, but all voluntary movement ceases.
- Plane 3, respiration rate becomes regular, depth of respiration increases, corneal and pedal reflex are slow but the palpebral reflex disappears.
- As anaesthesia progresses, respiration rate and tidal volume will decrease until respiratory arrest occurs.

Useful equipment used in anaesthesia

- Stethoscope and / or Oesophageal stethoscope (Remember with oesophageal stethoscopes you can loose the heart rate due to the probe moving around in the crop)
- ECG, using pads or needles rather than alligator clips. Avian ECG differs somewhat from its mammalian counterpart in that the RS wave is inverted in most species as a norm.
- Respiratory monitors and/or Capnographs are useful
- Pulse oximeters used cloacally or orally
- Thermometer

Post-operative recovery
• 100% oxygen
• Remove E T tube once bird starts to object to its presence
• Wrap in a towel, holding head if a parrot, and feet if a raptor, even the nicest parrot may bite during recovery
• Recovery from isoflurane should be over in 5-10 mins, if ketamine used it will take longer
• Food should be offered as soon as possible

Analgesia
• Best given pre operatively if possible (unless will cause increased stress) or as soon as anaesthetised
• Carprofen once daily IM, (pectoral muscle)
• Meloxicam once daily IM,
• These are NSAIDs, so care should be taken with patients with gastro-intestinal or renal disease.
• Buprenorphine IM q8-12h may be used in these cases or in more painful procedures but there is some debate on how effective this is with parrots
• Butorphanol IM Q4-6h is the preferred choice in parrots, and the injection may by given SC to prolong its efficacy
• Fluid therapy is often advised when using NSAIDs

Radiography positioning

Taking radiographs can be useful in diagnosing potential problems in an asymptomatic bird and also to obtain normal’s for that bird.

Positioning is important as legs and wings can obscure potential problems.

Ventro Dorsal Body
• Use either one mammography plate or divide it into two if a small bird. Mammography is a single sided film which gives a far better detail in small animals, but it does require higher factors.
• Keep the body as straight as possible, with the spine and the keel bone lying directly over each other.
• Open the wing out using dressing tape or sandbags to keep in place.
• Pull legs down and secure with more tape or sand bags.
• Keep the head / neck as straight as possible.
• Remember not to leave the bird in this position for very long and watch the respiration.

**Lateral View**

• Make sure the bird is correctly anaesthetised.
• Pull the wings back, separate with a sandbag and use tape to keep in place.
• Again keep the body as straight as possible and watch out for rotation.
• Keep head / neck as straight as possible

**Radiography points to remember**

• If using contrast like Barium, remember to keep the head raised to avoid fluid coming out of the crop and risking aspiration.
• When birds are in dorsal recumbency make sure the restraints are not too tight, which may restrict the breathing especially in a small bird.
• Also when birds are in lateral recumbency make sure the wing restraints are again not too tight, as this also restricts the respiration.
• When taken the radiograph, make sure you remove all restraints and return the bird to ventral recumbency as this is the best position for respiration.
• Make sure the patient is relaxed during positioning as the respiration may be compromised if the patients is tense.

**Fluid Therapy**

**Why is fluid therapy needed?**

• Maintenance needs
• Disease processes
• Post surgical needs (also for an anaesthetic lasting longer than 20 minutes)
• Electrolyte replacements

**Most common type of fluids used**

• General fluid mix is Aminoplus and Hartmanns at a ratio of 1:5 (1ml Aminoplus to 4ml Hartmanns), this is good for general dehydration, vitamin, amino acid with some electrolyte replacement.
• Colloidal fluids, used when serious blood loss occurs, hypoproteinaemia and in order to support central blood pressure.

• Blood transfusions, when PCV drops below 15%. Best performed from African grey to African grey, or Budgie to Budgie. The estimated blood volume is 10% of body weight, and up 1% of bodyweight may be extracted safely from the donor.

• Lactated Ringer’s solution, probiotic/electrolyte solutions such as Poly aid or Vytrate may be utilised or 5% dextrose solutions may be used orally.

Routes of fluid administration

• Oral, via a metal crop tube for parrots, or drip tubing for raptors. Soft feeding tubes can be used in parrots with the aid of a gag.

• Subcutaneous, in the inguinal web of skin, which attaches leg to body, the axillary region, under each wing, and the dorsal interscapular area.

• Intravenous, in the basilic and ulna (brachial) vein located on the underside of the wing in larger species, the right jugular vein, the medial metatarsal vein in waterfowl and large parrots, located along the medial aspect of the lower leg.

• Intraosseous, the proximal tibiotarsus or distal or proximal ulna are the preferred sites.

INTRACOELOMIC FLUID THERAPY SHOULD NEVER BE USED IN BIRDS!!!

Please see figure 1 of the respiratory organs. © Nigel Harcourt-Brown

Birds generally do not tolerate drips so IV fluids need to be given as a bolus

• A 25 gauge off the needle catheter can be placed generally in the Brachial Vein and sutured in place

• Isotonic fluids at 10-15 ml/kg per bolus, although up to 30ml/kg rarely cause problems.

• In emergencies where hypovolaemic shock has occurred a higher dose can be used.

• A guide for maximum bolus IV injection therefore is:-

    Finches = 0.5ml  Cockatoos = 14ml
    Cockatiels = 2ml  Harriers = 12-14ml
    African Grey Parrots = 8ml  Swans = 24-30ml

Oral fluid therapy

• Useful for mild cases of dehydration

• Not so good for seriously debilitated animals

• Useful for home use or where crop feeding tubes can be used
• The route is restricted to small volumes

An example of safe volumes of fluids administered by the crop of Psittacine species is given below:-

Budgerigar = 0.5-1 ml  
Conures = 5-7 ml  
African Greys = 8-10 ml

Approx 20ml per kg via crop as a starting point, but be careful with the fluid coming up if you fill up the crop. A thicker substance normally stays down better.

An example of safe volumes of oral fluids in raptors are:-

• 2-5 ml in smaller birds such as kestrels
• 15-20 ml in larger eagles

Please see figure 2 for a view of the viscera. © Nigel Harcourt-Brown

**Subcutaneous fluid therapy**

• Good for routine post-operative administration of fluids for longer recovery patients undergoing minor surgical procedures
• Maximum of 10-15ml at any one site in the larger species
• Maximum 1-2ml in a Budgerigar

**Calculation of fluid requirements**

Maintenance requirement = 50ml/kg/day

Fluid deficit = % dehydration x 10 x kg

So total daily requirement = maintenance requirement + fluid deficit

Some fluid deficits may be of too much volume to be administered rapidly. Fluid overload may lead to renal shutdown and pulmonary oedema, therefore it would be advisable to follow the following protocol.

Day one – maintenance fluids + 50% of calculated dehydration factor
Day two – maintenance fluids + 50% of calculated dehydration factor
Day three – maintenance fluids

Please see figure 3 for an example of fluid calculation.

**Feeding of avian patients in hospital**
There are many reasons why a bird may not eat and they are not always because they are sick.

- Disease or illness
- Pain, following beak surgery for example, or any other surgery
- Nervous
- Lonely and depressed, boredom
- Strange food
- Fussy eater

**How to encourage feeding**

- Treatment of disease or illness
- Supply pain relief if required, should ideally check biochemistry first
- When birds are highly strung or nervous it is best that they are kept away from loud noises etc. Also keeping the area dark will help to calm them
- However some parrots may become depressed if used to lots of human contact, therefore the use of a radio in the kennel room may be helpful, also visiting them throughout the day may cheer them up
- It is a good idea for parrots to have toys to play with, the one where the food is hidden inside are good, also pieces of paper/cardboard to destroy are good
- Checking with the owner what food the bird normally eats at home will help
- In the case of raptors the food should be warmed before offering, most raptors will be kept in a darkened areas but remember these most raptors hunt during the day and if they can’t see the food they may not find it

**Types of food offered to avian patients**

- Most parrots tend to fed on the parrot mix, this consists of sunflower seeds, nuts and dried fruit, this however is not the best type of food
- The best type is pelleted food as they can’t pick out what they like.
- A wide variety of fruit and vegetables should be offered, e.g. Strawberries, apple, carrots, broccoli etc..
- Raptors on the other hand require meat, this can be in the form of day old chicks, mice quails etc.
- When on oral medication it is important to remove any casting material for the food, to prevent the medication coming out with the cast
• When feeding previously frozen chick etc. it is important to warm them up in water or defrost them gradually in water as the defrosting process causes dehydration of the carcass.

**Tube feeding of Parrots**

• Requires metal crop tube, and a syringe

• Can use Critical Care formula, or Harrisons neonate / Juvenile formula

• Make the food up to the correct dilution

• Warm up the food by placing the syringe in warm water, keep the needle on the end

• Hold the parrot in a towel, with one hand holding the head and neck and leg the parrot rest it feet on your chest

• Palpate the crop to check that it is empty

• Insert the tube through the left side of the oral cavity and down the oesophagus in the right side of the pharyngeal cavity, DO NOT FORCE THE TUBE AS THIS MAY CAUSE DAMAGE.

• Once in the crop get an assistant to steady the syringe whilst you check that the crop tube is in the correct location

• You should be able to feel the spine, the trachea and the crop tube as the trachea is not easily visualised in the mouth, the end of the tube should also be palpated

• Introduce the food steadily but not too slow as this will increase holding time and therefore stress

• Avoid pressing on the crop as this may cause reflux of food/fluid

• A starting point for feeding amounts into the crop would be approx 20ml /kg 2 – times a day, depending on weight and dietary requirement (see packet)

**Tube feeding raptors**

• Requires section of drip tubing

• Hills A/D is best used, mixed thoroughly this will easily fit down the tube

• Warm up the food as before

• Hold the raptor in a towel as described earlier

• Palpate the crop as before

• An assistant can then hold the head, and wedge a finger in the side of the mouth holding the mouth open

• The trachea should be easily visualised allowing the tube to be inserted over the top of it
• Do not push the tube to far down as it may curl round and come back up
  Introduce the food as before

• 2-5ml may be given to smaller birds such as kestrels, up to 15-20 ml for the larger eagles
  Again avoid pressing on the crop as this may cause reflux

Avian Emergencies

• Any respiratory problems, can become very serious if not already

• Fractures etc... severe shock can be the killer in these cases, therefore the fracture is normally repaired the day after injury, so stabilise and supportive treatment first.

• Sour crop, can become life threatening due to an acute toxic reaction

• Egg binding, very painful and the patient is normally extremely shocked

• Twitching, falling off perch, could be low calcium

• Change of voice, could indicate an Aspergilloma for example, lodged in the trachea

• CNS signs such as unable to perch and falling over

• Birds hide their symptoms well, so when we see signs this means they are extremely ill therefore there is less time, so generally sick birds are advised to be seen as soon as possible

Examples of some transmittable diseases

Psittacine Beak and Feather Disease Virus

This is one of several avian circoviruses, it can be found in many species of free-ranging Australian parrots and has also been found in free-ranging African parrots. Acutely affected birds May die within 2 months of the onset of the disease.

• Symptoms include, deformed feathers, feather loss, deformed beak and claws, sloughing of beak, immunosuppression

• There is no cure therefore the disease is fatal

Psittacine Proventricular Dilatation Syndrome

This is a diseases which is believed to be caused buy a virus, it causes the proventriculus to become distended which can be palpated in severe cases, it can also be seen on a radiograph where the proventriculus fills the left lateral coelomic cavity.

The disease can be diagnosed with biopsies, ideally of the proventriculus but this is not really possible to do in a living bird, so a crop biopsy can be performed. The problem with the crop
biopsy is that it can give you a false negative as this disease does not always progress to the crop, so diagnosis is normally taken on symptoms and the response to medication.

• Symptoms include, progressively losing weight, passing undigested seeds, vomiting
• There is no cure, (treatment treats the symptoms rather than the cause) and eventually proves to be fatal
• Currently this disease has not been reported in New Zealand

**Avian Chlamydiosis**

This is caused by a bacterial organism which causes psittacosis in humans. Clinical signs in humans include “flu like” symptoms to more severe pneumonia.

• Zoonotic
• Birds may be carriers for months to years without showing any symptoms
• Macaws may show very little symptoms before being found dead at the bottom of the cage
• Symptoms include, clear nasal discharge, sneezing, conjunctivitis, greenish diarrhoea, dyspnoea and the classic ‘sick bird syndrome’ (dull, hunched and fluffed up)
• Is treatable with milder cases

All humans are susceptible, but those most at risk include:-

• the very young
• the very old
• those on immunosuppressive medication such as high dose corticosteroids and chemotherapy
• those with immunosuppressive diseases, such as diabetes mellitus and AIDS

**Figure 1**
Right lateral view of the Respiratory organs of the Blue-headed Pionus parrot.

This shows why Intracoelomic fluids are contraindicated in birds.
So for a 500g African Grey Parrot who is 5% dehydrated, the calculated daily fluid requirement would be as follows.

Maintenance requirement = (50ml/kg/day approx) 50 x 0.5 = 25ml per day

Fluid deficit = 5 x 10 x 0.5 = 25ml

Total daily requirement = 25 + 25 = 50ml per day

**Day one** = 25ml + 12.5ml = 37.5ml per day

This dose would be too much to give in one dose so I would divide it into four times a day.  
37.5 / 4 = 9.375 or 9.4ml four times a day

**Day two** = 25ml + 12.5ml = 37.5ml per day

Again 37.5 / 4 = 9.375 or 9.4ml four times a day

**Day three** = only maintenance in required as the fluid deficit has now been replaced so

25ml per day divided into three = 8.3ml three times a day

**NB:** Often when a bird is unwell and dehydrated it may be off its food as well, so if liquid food is given via a crop tube then the water content should be accounted for in the daily fluid requirement.
Note that the maintenance requirement for a parrot is roughly the same as a dog and cat despite the high metabolic rate. The main reason for this is that a bird excretes uric acid rather than urine and therefore does not loose as much fluid.

References and further reading


Simon J. Girling, Veterinary Nursing of Exotic Pets, 2003


G J Harrison, DVM and T L Lightfoot, Clinical Avian Medicine, 2006