# Nursing of large psittacines in practice

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ABSTRACT: The following article highlights specific aspects of nursing with respect to the treatment of large psittacines such as macaws. Legal aspects as well as biosecurity measures, hospital set up, dietary requirements and administration of medications are discussed. Tips for handling, restraint and feeding will provide a practical guide to give colleagues the knowledge and confidence to hospitalise avian patients.

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DOI: 10.1080/17415349.2015.1038334

## Introduction

Macaws and other large psittacines require specialised veterinary and nursing care when hospitalised. They are highly intelligent, attractive birds with strong beaks, sharp claws and loud voices. The physical and mental capacities of these beautiful animals need to be taken into consideration when caring for them in a hospital set up.

Veterinary surgeons and nurses need to bear in mind that traveling, handling and hospitalisation are stressful for the patient, and this can lead to a physiological alteration of the white blood cell count and other blood parameters (Davis, 2005; Speer & Kass, 1995). The potentially unwell bird is kept in a new environment, separated from its owner, with whom the bird often has a very close relationship. Therefore, stress levels and duration of hospitalisation should be kept to a minimum to support the clinical outcome. Clinicians can instruct owners to carry out treatments such as administering oral medication, crop feeding, nasal flushing or nebulisation at home to reduce the length and stress of the hospital stay.

## Legal background

Veterinary clinics and owners need to comply with the Animal Welfare Act (AWA, 2006) when keeping large psittacine birds in a private home, aviary or in a hospital setting. Husbandry and medical care delivery should comply with the five freedoms:

- Freedom from hunger and thirst
- Freedom from discomfort, pain and injury
- Freedom from disease
- Freedom to behave normally
- Freedom from fear and distress

In order to provide medical care for psittacine birds, compromises may have to be made with regard to space requirements and stress levels. The AWA (2006) not only prohibits 'unnecessary suffering', but also places on the owner and keeper the obligation to provide 'good husbandry'; this will include times of hospitalisation.

All macaw species are listed on the CITES (Convention on International Trade in Endangered Species of wild fauna and flora) appendices depending on their conservational status. The ownership of a pet does not require a CITES certificate, however if macaws are used for commercial purposes such as trade, display to the public and pet shows, they need a CITES permit (Animal and Plant Health Agency, 2014). Furthermore, the seller or breeder is required to have a sales certificate and owners should always obtain a copy of this certificate as proof of 'legal acquisition'.

## Requirements for hospitalisation

### Biosecurity

A strict hygiene and biosecurity protocol needs to be implemented when hospitalising any avian species to minimize the risk of spreading infectious and potentially zoonotic disease. Avian patients should be kept separately from small animals and waste products, faeces, urine and feather dust must not be transferred to other avian patients by direct or indirect (brushes, wipes etc.) contact.

Within the macaw family, Gold and Blue Macaws (*Ara ararauna*) can develop a pulmonary hypersensitivity known as 'macaw asthma'. Contributing factors are an increased amount of feather dust – especially from other species such as African Grey Parrots (*Psittacus erithacus*), Cockatoos (e.g. *Cacatua galerita*) and Cockatiels (*Nymphicus hollandicus*) – as well as poor ventilation (Welle & Reavill 2011). Dyspnoea can also be triggered by air-borne irritants such as air fresheners, perfumes and disinfectants, and these must be avoided.

Clinicians should be aware of highly infectious air-borne diseases (transmitted via faecal matter and feather dust), such as psittacine beak and feather disease (*Circovirus*), psittacosis (*Chlamydophila psittaci*) and Pacheco's disease (avian herpes virus). Some pathogens are very stable within the environment (one month to two years respectively) and a thorough cleaning and disinfecting protocol needs to be followed.

### Psittacosis *(Chlamydophila psittaci)*

It is recommended to test every hospitalised psittacine bird for *Chlamydophila psittaci* either via external laboratories or in-house ImmunoComb Antibody Test (Biogal). Psittacosis is a very common disease within the avian population. Psittacines, ducks and pigeons are the major reservoirs of the disease, which can affect all bird species and a wide variety of mammals including man (Fiddes, 2013). Published international prevalence levels range from 12–95 per cent in feral and racing pigeons, 16–81 per cent in psittacines and 12 per cent in exposed people (Harkinazad, Geens & Vanrompay, 2009).

Animals may show only mild or no clinical signs while shedding the antigen. Until proven otherwise, every sick parrot needs to be considered a potential carrier. Psittacosis can cause disease in immune-suppressed humans and all staff and owners need to be made aware of this. When handling a confirmed or suspected *Chlamydophila* positive patient, the use of appropriate PPE (personal protective equipment) is necessary.

### Disinfection

F10 solution is one of the recommended agents for disinfection, as it has been proven to be effective against viral, bacterial and fungal pathogens. Once mixed, F10 is stable for 15 months; it is non-corrosive and non-irritant to skin, eyes or respiratory system. The entire practice premises need to be treated weekly by fogging or after discharge of each avian patient and, due to the non-irritant nature of F10, fogging of hospital wards can take place with patients in situ. Instruments (e.g. gavage tubes, mouth gags, endotracheal tubes, etc.) need to be cleaned immediately after use and soaked in F10 solution. F10 SCXD is used to disinfect floors at least once daily and F10 SC in a 10:250 dilution to treat cages and kennels after every patient.

Use a different towel to restrain each patient and ensure all feeding bowls are thoroughly disinfected before reusing. Ensure hand washes and disinfectants are readily available and used by staff after handling each patient.

## Caging

Patients must be kept in suitable cages. Transportation cages may be used, if these are acceptable in size and build. They must be cleaned and disinfected to minimize the risk of introducing pathogens. Mesh cages are best avoided to reduce feather damage. The perch should be located in the upper third of the cage to allow enough space for the tail feathers and to avoid contact with soiling on the floor (**Figure 1**). The diameter of the perch should enable the bird´s digits to reach around ¾ of the diameter of the perch. In cases of seizures or extreme weakness, patients can be kept temporarily in a bedded kennel (**Figure 2**). It is essential that the hospital set up allows provision of sufficient heat and oxygen if required.

Patients should be kept in a secluded, darkened area with no visual contact with each other, to reduce stress levels. On the other hand, appropriate lighting is essential for patients to feed on their own, as parrots are less likely to eat in the dark. Flickering lights or strobe effects need to be avoided as these can cause irritation to the sensitive bird vision and have been shown to have the potential to cause seizures in peregrine falcons (Verwoerd, 2001). A resting period of 12–14 hours should be provided during the night. Within the hospital environment, cages might be covered, lights turned off and staff instructed to avoid noise as well as to minimise walking in and out of the exotic ward (except for times of feeding/medication). In cases of prolonged hospitalisation enrichment with different food items, paper boxes, etc. should be considered.

**Figure 1.** Transportation cage of a macaw (note sufficient strength and height of perch)
Photo courtesy of Great Western Exotics

**Figure 2.** Soft bedding provided for weak animals
Photo courtesy of Great Western Exotics

## Diagnostics

The importance of making an early specific diagnosis in avian clinical cases cannot be over emphasised. This will generally require radiographs, haematology, biochemistry, cytology and *Chlamydophila* serology.

## In-patient care

### Handling and restraint

All necessary equipment and medication should be prepared prior to catching the bird. Cover windows to avoid injury if a bird were to escape into the room. Ensure windows and doors are closed and that no member of staff enters or leaves the room while the bird is not caged or safely restrained. To minimize the total length of handling time, there should be a member of staff available to clean out the cage, while a vet and a nurse are medicating the patient. All staff present in the room need to wear ear protectors when handling macaws.

Use a sufficiently large and thick towel in a darkened room to capture the patient. Blue or red light can be helpful when restraining birds, as it has a calming effect on them, limiting their vision while enabling the handler to catch them.

Care must be taken to ensure safety for the handler and patient. Gently wrap the towel around the bird and secure the head first, followed by the wings (**Figure 3**). Restraining the head can be more easily achieved when the bird is holding onto the bars of the cage. The head can be safely restrained by placing two fingers on the mandibular joint and index finger on top of head. This method can be used for physical examination or administration of intramuscular, subcutaneous and intravenous injections.

Sedation with gaseous anaesthetics should be considered for prolonged or painful procedures, e.g. bandage changes, wound debridement, etc. (**Figure 4**). The anaesthetist needs to be aware of the species-specific anatomical features which influence certain aspects of anaesthesia. Due to the narrowing of the trachea in macaws and closed tracheal rings, care must be taken to ensure endotracheal tubes do not cause life threatening tracheal stenosis (**Figure 5**); specialised endotracheal tubes should be used (please refer to avian anaesthesia literature for further details).

**Figure 3.** Safely restrained macaw
Photo courtesy of Great Western Exotics

**Figure 4.** Induction of gaseous anaesthesia in a macaw
Photo courtesy of Great Western Exotics

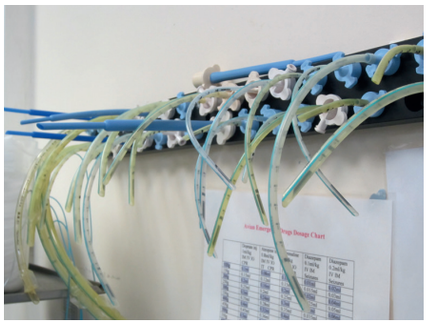

**Figure 5.** Different sized endotracheal tubes
Photo courtesy of Great Western Exotics

## Diet

A macaw's diet in the wild consists of different seeds, nuts, fruits and seasonal plants (Koutsos et al 2001). Unfortunately, a large number of captive psittacines are fed an inadequate, seed-based diet, which is deficient in vitamins; any bird on such a diet will in time inevitably suffer from vitamin A and calcium deficiency. Hypercholesterolaemia, resulting in arteriosclerosis and increased susceptibility to infections, is also a common feature.

Correct diet and feeding which should include pelleted diet to prevent selective feeding, suitable fruits and vegetables and encouragement of foraging behaviour, should be discussed with the owner. During hospitalisation and recovery the patient should be offered a familiar diet to stimulate eating and where possible the owner can be encouraged to bring in the patient's normal diet. Fruits and vegetables should be offered in a bowl as well as a fruit holder and should be removed after six hours to prevent bacterial growth. Due to the high avian metabolic rate, inappetence must be addressed in hospital, and crop gavage feeding will be necessary in any bird not eating for itself. Dietary requirements should be calculated using the following equation for the basal energy requirements (BER):

$$BER\ (kcal/day) = 78 \times (bodyweight\ in\ kg)^{0.75}$$

The equation may be adjusted to take into account individual disease factors and meet specific needs:

1.25 × BER with renal or hepatic disease

1.5 × BER following trauma or sepsis

Patients should be weighed each morning before they are fed or

medicated. This can be done by placing the patient, wrapped in a towel, on the scales and subtracting the weight of the towel, or by weighing the cage with and without the patient. A trained parrot can also be asked to step onto a perch connected to scales. Any patient must maintain or gain weight daily, if it does not, the volume or frequency of feed must be increased.

A volume of 3 per cent of body weight (i.e. 30 ml/kg) can be given at each feed. Crop feeding may be necessary 3–4 times a day, even though stress levels need to be considered in some individuals. Different critical-care diets are available (e.g. Emeraid critical care, Harrisons recovery formula). Care must be taken that food is not too hot, as it may cause a thermal burn of the crop.

### Crop feeding

Crop feeding of large psittacines should be done by experienced vets and nurses. The crop is located on the right side of the thoracic inlet. A metal feeding tube of appropriate size is used. The head and neck are restrained securely to avoid injuring the oesophagus. The feeding tube is inserted into the oral cavity from left to right, avoiding the glottis (the opening to the trachea) in the caudal tongue; it should pass down the oesophagus easily, without any resistance (**Figure 6**). It is helpful to palpate and visualize the tip of the tube within the crop on the right side of the bird's neck and, if correct placement is verified, food should be administered slowly.

After removing the feeding tube, the bird should be placed back in the cage immediately to minimize risks of regurgitation and aspiration of food. In patients initially presented with regurgitation, intravenous or subcutaneous fluid therapy and anti-emetics (e.g. metoclopramide) should be administered. Once settled, small volumes of electrolytes are given orally and, if kept down, feeding is commenced with small volumes (one per cent of bodyweight) at first.

**Figure 6.** Crop feeding
Photo courtesy of Great Western Exotics

## Medication and fluid therapy

An exotic animal formulary, e.g. Carpenter (2012) or vetformulary.com, must be consulted regarding appropriate drug dosages, and owners must be made aware of potential off-licence use of medications.

### Routes of medication/fluid administration

Multiple routes are available for drug administration.

*Oral medication:* Oral medication can be given with assisted feeding (see Crop feeding, above) or directly into the mouth. A syringe can be inserted into the side of the beak to administer a small amount of soluble medication. It should be noted that a macaw will destroy any sized plastic syringe easily if given the chance.

*Injection:* The pectoral muscle is used for intramuscular injections. The needle is placed lateral to the keel at an angle of 45°–90° to the muscle; aspiration should be performed and the hub of the needle should be stabilised with one hand to avoid deeper injection. Subcutaneous injection can be given between the shoulder blades or into the inguinal fold. Note that, due to the small subcutaneous space, fluids will accumulate in a nodule and will be absorbed quickly. Intravenous catheters can be placed (under anaesthesia) in the ulnar vein and transfixed with tape and stay sutures (**Figure 7**).

The patient should be monitored for any interference with the catheter site. Tolerance of the catheter is usually good (98%), but may vary with species, individuals and improved well-being. Other sites for venepuncture include the right jugular vein and medial metatarsal vein. Digital pressure should be applied to the vein after venepuncture to avoid any blood loss. Placement of an intraosseous catheter may be necessary in debilitated animals. Suitable sites include the distal ulna or proximal tibio-tarsus, however the femur and humerus should be avoided as they are pneumatised bones.

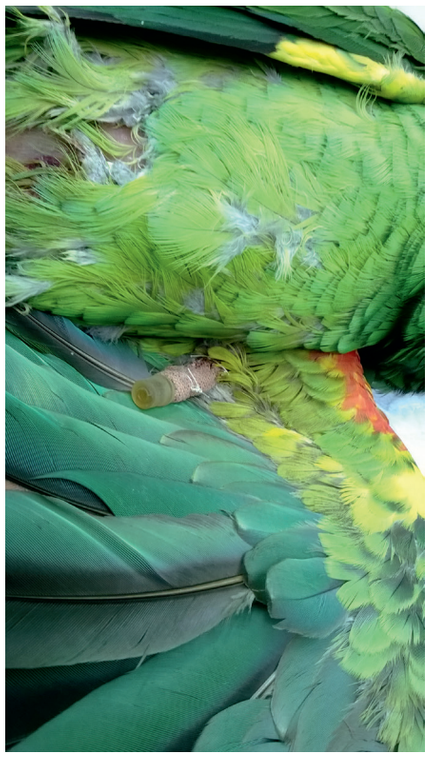

**Figure 7.** Intravenous catheter placed in ulnar vein
Photo courtesy of Great Western Exotics

*Nebulisation:* Nebulisation is a very useful route by which to administer medication to patients with respiratory disease. A nebuliser producing particles smaller than 3 µ in diameter should be used, to ensure medication will reach parabronchi and small air capillaries. Multiple medications such as bronchodilators, antibiotics, antifungals and antiseptics can be delivered by nebulisation 2–3 times daily (Mickley & Pollock, 2013).

### Fluid requirements

Daily fluid requirements consist of 50 ml/kg/day maintenance plus deficit replacement.

Fluid deficit in ml =
% dehydration × bodyweight in kg × 10

Every sick/anorexic bird should be considered to be 5–7 per cent dehydrated; patients may show enophthalmus and signs of shock when 10–12 per cent dehydrated. Half of the fluid deficit should be replaced within the first 24 hours, together with daily maintenance requirements. The remaining 50 per cent should be given over the following 48 hours. Daily fluid intake can comprise oral fluid with the food plus intravenous and subcutaneous provision.

Suitable fluid choices include isotonic crystalloid fluids such as saline or lactated Ringer's/Hartmann's solution. A supportive vitamin and electrolyte solution such as Duphalyte (Pfizer Ltd) may be added to achieve a 20% solution. In cases of hypovolaemia and blood loss, hypertonic crystalloid or colloid fluids may be used. The fluids must be warmed up prior to administration and 10–20 ml/kg should be given 3–4 times daily, as boluses, over 3–5 minutes via an intravenous catheter.

## Further considerations

As mentioned above, biosecurity plays a vital part when hospitalising birds. Other practical considerations include availability of space, equipment and staff. As prey species, avian patients will hide any sign of disease as long as physically possible; hence a sick bird with even subtle clinical signs should be seen as soon as possible. Due to the nature of avian medicine, adequate out-of-hours facilities and trained staff should be at hand. With the appropriate equipment and knowledge it is very rewarding to treat these long-lived, beautiful, animals successfully.

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