

## Neither dog nor cat – Part II: Birds, reptiles, and amphibians

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### Birds – Psittacines (parrots) and Passerines (finches etc)

#### Basic needs, husbandry, and environment

Always remember that an accurate history and full assessment of environment and diet are critical for sorting out illness in birds.

- Nutrition – seed based diets provide poor nutrition – they are low in calcium, vitamins and protein, and high in fat. Pellets are better and well-balanced. Some foods can be toxic to birds (chocolate, avocados, comfrey, peanuts (aflatoxins)) and foods high in salt, sugar, or caffeine should be avoided. Keep the diet interesting and varied, but not during illness. Body condition is judged by palpating the muscles around the keel – normally, the edge of the keel can be palpated between the pectoral muscles which slope slightly on either side. All birds should be given access to supplementary calcium in their cage (cuttlebone, mineral block, crushed oyster shell, or baked crushed eggshell). Hospitalized birds need to be weighed daily to ensure their nutritional needs are being met.
  - Parrots: Pellets should make up 80% of parrot diets, with the rest consisting of dark green and dark yellow vegetables (leafy greens, carrots, sweet potatoes) offered daily. Fruits and seeds are given as treats only (twice weekly).
  - Budgies and cockatiels require seed up to 50% of daily intake (pellets alone are too high in protein).
  - Canaries and finches also require about 50% seed in diet, along with pellets and fresh vegetables.
  - Lories and lorikeets eat nectar, fruits, and pollen. Provide fresh fruits and powdered diets.
- Daily fluid requirement is approximately 50ml/kg/day. Water offered should not be distilled, as this removes salts and minerals. Water can be delivered via sipper tube or placed in a protected bowl (covered over top to prevent faecal soiling).
- Newspaper is a good item for cage bottoms as it allows visualization of urine and faeces.
- Temperature range – body temperature is 38.9-40°C. It is difficult for birds to adjust to temperature extremes as they cool off only by panting and warm up by fluffing feathers (which is energy intensive). They can adjust to cooler temperatures if allowed to acclimate and increase their down. Birds molt once to twice yearly.
- Any enclosure must be large enough for the bird to fully extend both wings. Plenty of space for flight and climbing is ideal as birds are quite inquisitive and can develop destructive habits if bored.
- Social interaction – any new additions to the house should be quarantined for 30 days; birds are gregarious and usually appreciate company.
- Birds have a very sensitive respiratory tract and should be removed from their enclosure

when disinfecting and cleaning the environment. Rinsing of all items after cleaning is strongly recommended.

### Restraint and handling

First and foremost, assess the bird at a distance to ascertain if it can handle restraint. Never restrict movement of the sternum as bird will suffocate. Minimize handling time by having all anticipated equipment ready to use prior to capturing the bird. For smaller birds (finches, canaries, possibly lovebirds and budgies) switching off the lights just prior to capture may be helpful. The person restraining the bird is responsible for its well-being, so alert others if the patient is becoming dangerously stressed. If crop feeding, do this last and immediately replace the bird in the cage to avoid aspiration.

### Normal 'abnormalities'

- Skin: very thin skin. Bruises will be green (rather than yellow) as birds lack the enzyme needed to convert biliverdin to bilirubin.
- General anatomy: Variable number of cervical vertebrae (8-25). No diaphragm, so liver sits next to the heart. No lymph nodes, but possess lymphatic vessels.
- Eyes: Pupil dilation controlled by voluntary striated muscle (rather than smooth muscle), so atropine will not work for dilation of pupils. No tapetum.
- Respiratory: Large trachea, complete tracheal rings (use uncuffed endotracheal tubes); must move sternum to breathe as no diaphragm present. Vocalize from the syrinx (at the tracheal bifurcation) so will be able to vocalize if intubated. Air delivery to lungs from trachea and air sacs is continuous, maximising oxygen delivery to blood.
- Digestive: No diaphragm, so have 'coelomic' cavity rather than 'abdominal' cavity. No teeth. Crop is an out-pouching of the oesophagus. Possess proventriculus (glandular stomach) and ventriculus (gizzard). Cecum/gall bladder may or may not be present depending on type of bird. Small numbers of bacteria in faeces should be gram-positive.
- Reproduction: The right ovary in females usually fails to develop. Gender differentiation often through genetic analysis, with the male being the homogamete (ZZ) and the female being the heterogamete (ZW).

### Surgical and anesthetic concerns and techniques

- Thin skin can be difficult to suture, and there is little to no subcutaneous tissue. 4-0 or 5-0 suture is usually required.
- Air sacs can be catheterized to provide either oxygen or anaesthetic, as well as bypass tracheal obstructions.
- Anaesthesia usually via mask induction; isoflurane or sevoflurane are best choices. Use uncuffed ET tubes (trachea narrows past the glottis – do NOT force tubes; use a smaller one if it appears to be getting lodged) – if intubated, reduce oxygen flow rate to 1L/min to avoid damaging air sacs.
- Always elevate the head and crop to avoid aspiration of crop contents.
- Minimize anaesthesia time as birds are prone to hypothermia, hypoventilation, and respiratory acidosis under anaesthesia.
- Protect eyes with lubricants and ensure they are not being rested upon.
- Monitoring of respiratory rate and depth are essential; pulse oximetry, Doppler probes, and ECGs can assist in monitoring.
- Analgesia is different for birds than mammals – butorphanol at high doses (1-2mg/kg IM – Paul-Murphy 1999) has been shown to be more effective than buprenorphine (Paul-Murphy 2004). Assume birds that have potential for pain (surgical, trauma) are painful and treat them. Pre-treat all surgical cases with butorphanol. Some doses:
  - Lidocaine 1mg/kg at site, diluted 1:10
  - Butorphanol 0.5-2.0mg/kg IM every 2-4 hrs PRN
  - Meloxicam 0.1-0.4mg/kg q24hr PO
- Surgical prep should be done gently as birds bruise easily. Minimize use of saline and mths to avoid hypothermia. Pluck feathers one at a time, under surgical plane of anaesthesia.
- Fluids should be given at 10ml/kg/hr.

### Common ailments and treatments

Some common signs of illness include feather destruction, sitting on cage bottom, fluffing, shivering, regurgitation, personality shifts, a change in the amount/appearance of droppings, open-mouth breathing and tail bobbing, and an inability to perch.

### Infectious diseases

- Chlamydiosis – *Chlamydophila psittaci* – zoonotic. Transmission by inhalation or ingestion. Survives in soil up to three months. Signs vary, but can include depression, lethargy, anorexia, dyspnea, nasal or ocular discharge, conjunctivitis, and biliverdinuria (green urates). Spleen and liver enlargement is common. Treatment = doxycycline x 45 days.
- Other bacteria – infection usually associated with gut or respiratory signs. Gram negative bacteria are the most common pathogens, but gram positive and anaerobes can contribute as well. Usual therapy is enrofloxacin, trimethoprim-sulfa, or cephalosporins.
- Viral – pox virus; polyomavirus (high mortality, subcutaneous haemorrhage present, very stable in environment, vaccine available). Psittacine Beak and Feather Disease (PBFD) – circovirus, very stable in environment; results in symmetrical slowly progressive dystrophy of feathers that worsens with each molt; immunosuppression is common.
- Fungal – Aspergillosis (respiratory disease) – treatment = conazoles; Candidiasis (gut disease) – treatment = nystatin.

### External and internal parasites

Ascarids (GI signs), giardia, trichomoniasis. Syngmus (tracheal worm). Knemidokoptes pilae (scaly leg/face mite). Chewing lice.

### Nutritional deficiencies

- Hypovitaminosis A (from all-seed diets). Signs include erosions on the feet, poor quality skin and feathers. Secondary respiratory infections are common. Provide dark yellow vegetables (sweet potato, carrots); can give a single dose of vitamin A as injection.
- Hypocalcemia (also from seed diets) in African Grey Parrots – can present with seizures. Supplement calcium and improve diet.
- Probiotics may be beneficial for birds being hand reared, on antibiotics, or who have crop stasis.

### Skin disorders

Bumblefoot (ulcerative pododermatitis) can occur with poor quality perches or vitamin A deficiency. Nails are too long if arcing more than a half-circle. Beak trims may be needed with malocclusions.

- Feather picking can be secondary to internal or external parasites, chronic zinc toxicosis, allergies, folliculitis, liver disease, or be psychological.

### Gut disorders

Crop burns can occur with hand feeding of birds, especially if feed is warmed in the microwave. Surgical repair of defects and supportive care required.

### Reproductive disorders

Egg binding – low calcium (seed) diets contribute. Egg becomes lodged, applying pressure to the kidney and subsequent shock and death. Treatment includes high humidity environment, calcium IM, oxytocin if the egg is not over-sized, possible collapsing of the egg, possible surgery, and supportive care.

### Toxins

- Heavy metal toxicity – lead, zinc ingestion. Signs include depression, weakness, regurgitation, and possible neurologic signs. Diagnose via xrays (can be done awake with bird in a box to show larger metal foreign bodies) or blood levels. Treat with chelating agent. Peanut butter may help to remove metal from gut.
- Non-stick cookware, if overheated, will release fumes which cause fatal pulmonary haemorrhage in birds.

### Administration of medications and fluids

- Relevance of air sacs in birds – Intraosseous administration of fluids and medications must be done with care as many of the bones are part of the air sac system. Use the distal ulna or proximal tibiotarsus. Intraosseous catheters may be left in place for up to 5 days if placed with sterile technique.
- Other routes:
  - Do not give fluids/medications intraperitoneally (intracoelomic) as there is great risk of administration into an air sac.
  - Warm all fluids prior to administration in birds.
  - Give intramuscular injections into pectoral muscles.
  - Drugs in water or food may not be dosed accurately and drugs given directly by mouth may suffer poor absorption in ill birds.
  - Subcutaneous injection (typically done into the inguinal area) may cause irritation and loss of drug or renal toxicity due to blood shunting.
  - Nebulisation can be used for pulmonary medications.
- Drug contraindications:
  - Birds can shunt blood from the caudal half of the body through the kidneys, so injected medications should be given in the front half of the body to avoid increase excretion and/ or renal damage.
  - Ivermectin should not be injected intramuscularly into birds as they can die from an anaphylactic reaction.

### Diagnostics

- Xray – usually done under general anesthesia; VD and lateral views.
- Blood testing sites – right jugular vein (is 2/3 larger than the left), basilic (or cutaneous ulnar) vein, medial metatarsal vein. Note that the cutaneous ulnar vein can also be used to assess refill time (if any delay in refill noted estimate at least 5% dehydration, >1 second is 10%).
- Uric acid used to evaluate renal function, not BUN.
- Normal glucose is double that of mammals.
- Maximum collection of 1% of total body weight (1ml per 100 grams) of blood.
- Cytology – birds have nucleated red blood cells, heterophils instead of neutrophils, and thrombocytes (not platelets). Red blood cells have a reduced life span (38 days) when compared to mammals. Normal fecal gram stain will be gram positive rods; gram negative organisms are considered pathogens, Candida should be no greater than three per field at 100x.

### References

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