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Practical Emergency & Critical Care of Pet Birds

Critically Ill Birds - What to Look For

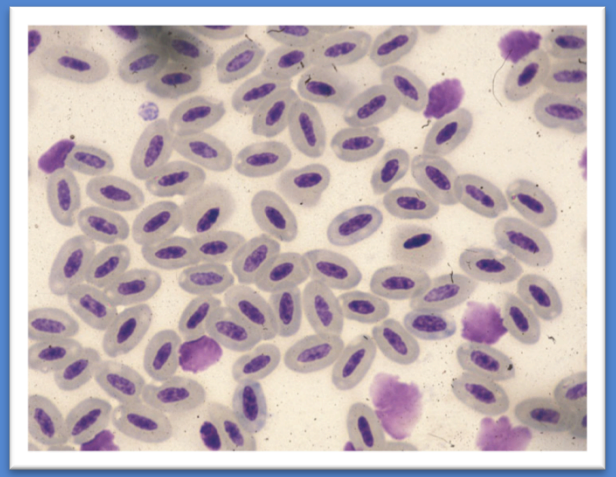
- **Clinical signs**
  - Dyspnea
    - Tail-bobbing
    - Open-mouth breathing
  - Weakness/collapse
  - Fluffed
  - Dehydration
  - Diarrhea
  - Polyuria
  - Seizures
- Blood loss
  - Bloody droppings
  - Wounds
- Head trauma

Critically Ill Birds – What to Ask

- **Brief history**
  - Where obtained?
  - Enclosure and diet?
  - Appetite and energy level?
  - Previous illness?
  - Exposure to other birds or toxins?
  - Current signs/ symptoms?
  - Current or previous treatments?

Critically Ill Bird – What to Think About

- **Hypovolemia/Hypotension**
  - Body fluid volume = @ 60% of adult BW
    - Intracellular compartment
    - Extracellular compartment = plasma + interstitial space
  - Blood volume = 4.4-8.3% of BW (greater in young)
  - RBC lifespan = @ 35-42 days (pigeon)
  - Birds tolerate blood loss better than mammals
    - Rapid fluid movement from extravascular (interstitial) space into vascular space
    - Ability of hemoglobin to give up oxygen to tissues rapidly
  - Dehydrated birds resorb water through cloacal stasis



Critically Ill Bird – What to Do

- Observe before handling
  - Breathing, posture, droppings
- Give oxygen +/- air sac tube if dyspneic
- Perform physical examination, if stable
  - Stage examination if too stressed
  - Weigh
  - Assess hydration status & conjunctival mucous membrane color
- Collect minimum database, if size & stability permit
  - Venipuncture best; nail clip if severely anemic/hypovolemic
  - Blood smear
  - PCV/TS, glucose

Critically Ill Bird – What to Do

- **Thermoregulate**
  - Body temperature depends on size (emu 100.6º F to pigeon 107.9º F)
  - Heat lost through metabolic failure & contact with unheated surfaces if unable to stand
- **Provide thermal support**
  - Ensure warm (85˚-90˚F), quiet environment
  - Make food & water accessible
  - Warm parenteral fluids
  - If head trauma or hyperthermia, maintain at lower temperature (75˚F)

Critically Ill Bird – What to Do

- **Administer fluids**
  - Maintenance rate = 50 ml/kg/day
  - Estimate fluid deficit due to loss (hemorrhage) & shift (to site of injury or infection)
  - Calculate fluid deficit (ml) = dehydration (%) x BW (g)
  - If dehydrated, give maintenance amount + 1/2 fluid deficit over 1st 12-24 hrs, second 1/2 over next 48 hrs
  - If severely dehydrated, bolus up to 10 ml/kg IV, IO over 5-10 minutes

Critically Ill Bird – What to Do

- **Administer fluids**
  - Slow administration
    - Continuous rate infusion
    - Syringe & infusion pumps
  - IV, IO, SC depending on degree of dehydration
    - SC: lateral flank – if mildly dehydrated
    - IV: jugular vein, medial metatarsal vein, ulnar vein – if more severely dehydrated
    - IO: ulna, tibiotarsus – if can't access a vein

Critically Ill Bird – What to Do

- **Administer fluids**
  - Crystalloids most often given
    - Lactated Ringer's (LRS) if acidotic
    - 0.9% NaCl
    - LRS + 50% dextrose (5% solution) IV, IO if weak or emaciated
    - Supplement KCl (0.1- 0.3 mEq/kg) if hypokalemic from persistent regurgitation (rarely)

Critically Ill Bird - What to Do

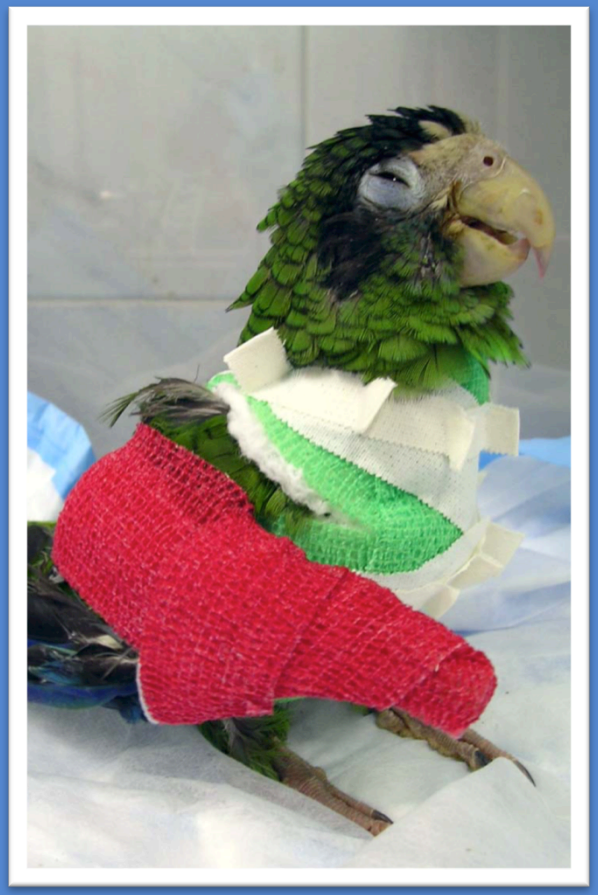
- **Administer fluids**
  - If hypovolemic from hemorrhage, endotoxemia
    - Hypertonic saline: 2-5ml/kg IV slowly over 10-15 min
    - If no response, add colloids
      - Hetastarch, dextrans: 10-20 ml/kg IV slowly over 10-15 min
        - Contraindicated with severe dehydration, head trauma, hypernatremia
    - Follow with maintenance crystalloids

Critically Ill Bird – What to Do

- **Catheterize**
  - Place IV catheter
    - Right jugular vein, medial metatarsal vein, ulnar vein
    - Sedation necessary unless extremely weak
    - Use sterile technique
    - 24- to 26-gauge catheter stabilized to skin with tape, surgical glue, or suture and bandage

Critically Ill Bird – What to Do

- **Catheterize**
  - IO catheter
    - If too dehydrated to find a vein or if too small a patient
    - Medial ulna at distal carpus or tibial crest of tibiotarsus
    - 24- to 26-ga. catheter or spinal needle
    - Suture butterfly tape (around catheter hub) to skin
    - Bandage
      - With ulnar catheters, immobilize wing with figure-of-eight bandage



Critically Ill Bird – What to Do

- **Transfuse**
  - Indications:
    - Acute blood loss
    - If PCV< 20%
  - Homologous transfusions (psittacine to psittacine, raptor to raptor) ideal
  - Try for similar geographic origins (i.e. African birds to African birds)
  - Heterologous transfusions don't typically last long

Critically Ill Bird – What to Do

- **Transfuse**
  - Collect 1% in ml of donor's weight in grams
  - Mix with acid citrate dextrose (0.15 ml of ACD/ml of blood)
  - Give @ 10-20 % of recipient's blood volume in mls (@ 1% of BW in grams)
  - IV or IO
  - Iron dextrans, B vitamins, and fluids if anemic

Critically Ill Bird - What to Do

- **Provide nutritional support**
  - Tube feed if anorexic or emaciated as long as not vomiting
  - Feed after other procedures to avoid aspiration
  - Palpate crop before feeding
  - Warm hand-feeding formula first to 101˚-104˚F
  - Calculate volume to be fed from BW & maintenance fluid requirements
    - 100g BW x 50ml/kg/day =5 ml/ day
  - Feed 2-4 times/day

Critically Ill Bird - What to Do

- **Provide pain relief**
  - Administer analgesia to injured, lame, or burned birds or pre-operatively
    - Butorphanol tartrate (0.5-4.0 mg/kg IM)
    - Meloxicam (0.5-1.0 mg/kg IM, PO)

Common Bird Emergencies: Collapse/Profound Weakness

- Stabilize before diagnostic tests
  - PCV, blood glucose
  - Fluids +/- dextrose, IV or IO
  - Broad-spectrum, bactericidal antibiotics
    - Enrofloxacin (7.5-15 mg/kg IM, PO q 12h)
    - Cefotaxime (75-100 mg/kg IM, IV q 4-8h)
    - Amikacin (10-15 mg/kg IM, IV q 12h, if hydrated)
- Diagnose – when stable
  - Work-up underlying disease
  - CBC, chemistry, EPH, radiographs, etc.

Common Bird Emergencies: Respiratory Distress

- Stabilize before diagnostic tests
  - Provide oxygen - if severely dyspneic, before handling
  - Sedate
    - If fractious & dyspneic, sedate with isoflurane to examine
    - If stressed, administer midazolam (1.0-2.0 mg/kg IM, IN) before handling
  - Place air sac tube - if upper air way obstruction
  - Perform endoscopy or suction - if acute tracheal obstruction
  - Administer diuretics - if suspect cardiac disease/fluid accumulation

Respiratory distress

- Stabilize before diagnostic tests
  - Coelomocentesis - if ascites
    - Insert 21- to 25- ga. butterfly needle on midline, caudal to sternum & directed to right (avoid ventriculus)
    - Aspirate fluid for cytology & culture

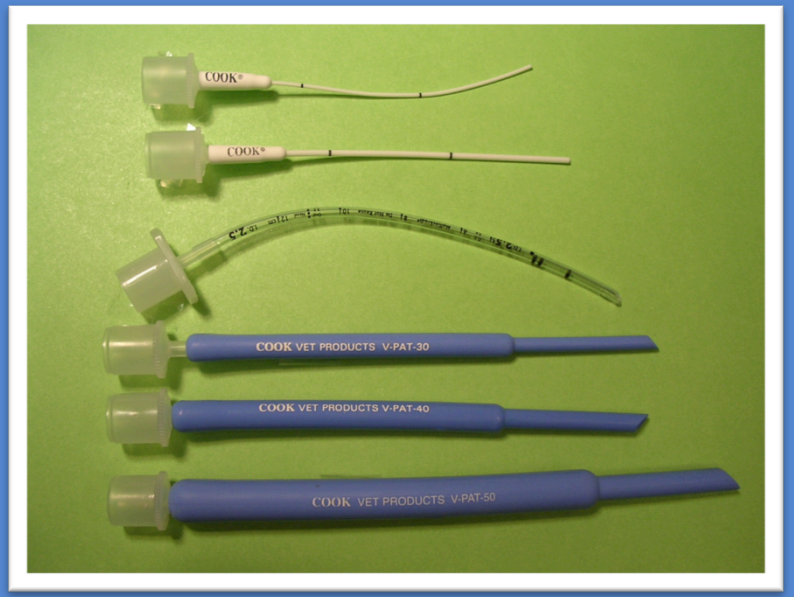
Respiratory Distress

- Stabilize – before diagnostic tests
  - Nebulize - if suspect infection
    - Ultrasonic nebulizer producing particles < 3 μm in diameter
    - Broad-spectrum antibiotics until culture & sensitivity results available
      - Cefotaxime (100 mg in 10 ml saline q 6-12h)
      - Enrofloxacin (100 mg in 10 ml saline q 6-12h)
      - Gentomicin (50 mg in 10 ml saline q 6-12h)

- Diagnose – when stable
  (CBC, chemistry, EPH, Chlamydia testing, radiography +/- contrast, CT, ultrasonography, endoscopic biopsy & culture, cytology & culture)

Common Bird Emergencies: Cardiopulmonary Arrest

- **Stabilize – before diagnostic tests**
  - Intubate with uncuffed endotracheal tube
  - Ventilate every 4-5 seconds
  - Monitor heart with ECG and Doppler
  - Apply chest compressions if no heartbeat
  - Administer appropriate drugs
    - Epinephrine (0.5-1.0 ml/kg IV, IO, IT, IC)
    - Atropine (0.5 mg/kg IV, IO, IT, IC)
    - Fluids (bolus IV)
- **Diagnose** - work-up underlying disease when stable (CBC, chemistry, EPH, radiographs, etc.)



Common Bird Emergencies:
Head Trauma

- Place in dark, quiet, cool (75˚F) environment
- Provide fluids IV, SC
  - If intracranial hemorrhage, give only 1/2 to 2/3 of replacement volume
- Administer appropriate drugs
  - Mannitol (0.5 mg/kg IV slowly) if poor response to other therapy

Common Bird Emergencies: Seizures

- Stop seizure - before diagnostic tests
  - Administer drugs
    - Diazepam (0.5-1.0 mg/kg IV, IM q 8-12h)
    - Dextrose (50-100 mg/kg IV slowly to effect)
    - Midazolam (0.8-1.5 mg/kg IM, IV)
    - Calcium gluconate (10-100 mg/kg IV) if hypocalcemic
  - Pad cage to reduce trauma
  - Make food & water easily accessible
  - Tube feed if anorexic
- Diagnose - when stable

  (CBC, chemistry, EPH, heavy metal levels, radiographs, CT, MRI)

Common Bird Emergencies:
Severe Diarrhea

- Bird may be dehydrated & weak
- Stabilize - before diagnostic tests:
  - Provide fluids IV, IO
  - Administer antibiotics effective against gram-negative bacteria
  - Tube feed
- Diagnose – when stable

(CBC, chemistry, EPH, viral & Chlamydia testing, heavy metal levels, fecal Gram's stain/aerobic & anaerobic culture & sensitivity/ cytology/float, radiographs +/- contrast)

Common Bird Emergencies:
Severe Vomiting

- Bird may be dehydrated and weak
- Stabilize - before diagnostic tests
  - Provide fluids IV, IO, SC
  - NPO until vomiting stops
  - Give IV/IO dextrose if weak
  - Administer parenteral drugs (antibiotics, antifungals) until vomiting stops
  - Administer oral drugs (antibiotics, antifungal agents) if vomiting stops
- Diagnose – when stable

(CBC, chemistry, EPH, heavy metal levels, crop & fecal Gram's stain +/- culture, radiographs +/- contrast, fluoroscopy, endoscopy, CT)

Common Bird Emergencies: Crop Stasis

- Stabilize –
  - If dehydrated, weak:, provide fluids IV, IO, SC
  - Flush crop with warm water to remove impactions; repeat PRN
  - Perform cytology, culture, Gram's stain crop swab
  - Administer drugs
    - Antibiotics, antifungals
      - Based on crop swab cytology
    - Lugol's iodine if suspect hypothyroidism
    - Motility modifying drugs to aid crop emptying
      - Metaclopramide (0.5 mg/kg IM, IV, PO q 8-12h)
      - Cisapride (0.5-1.5 mg/kg PO q 8h)
  - Gavage-feed small volumes of hand-feeding formula frequently

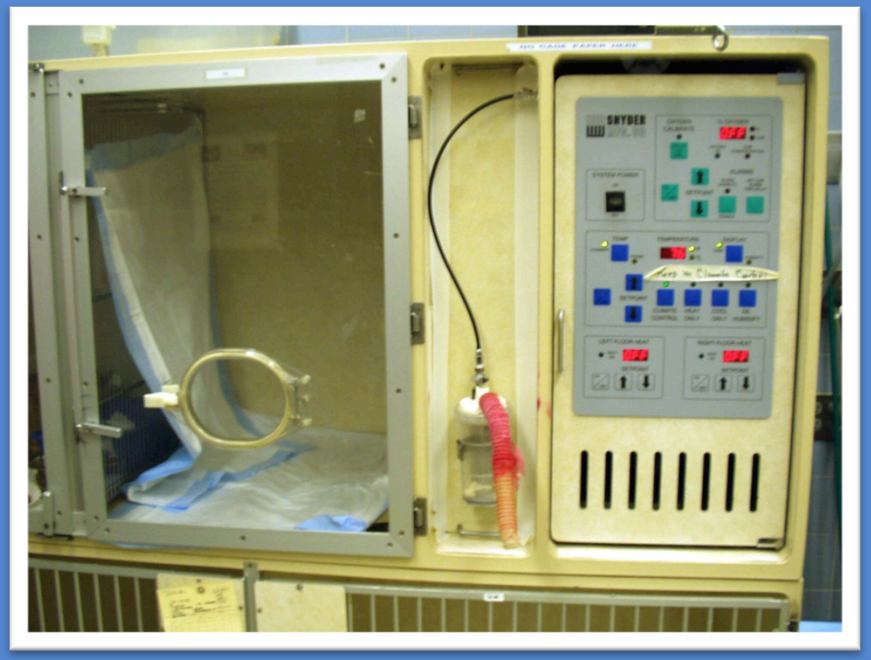
Diagnose – when stable (crop & fecal Gram's stain +/- culture, CBC, chemistry, EPH, heavy metal levels, viral testing, radiographs +/- contrast, fluoroscopy, endoscopy)

Common Bird Emergencies: Crop Burns

- May be weak & dehydrated despite good appetite
  - Food leaking from burn fistula
  - +/- secondary bacterial or fungal infection
- Stabilize
  - Provide fluids IV, IO, SC
  - Administer antibiotics & antifungals
  - Gavage-feed small volumes of hand-feeding formula frequently
  - Offer pain relief
    - Butorphanol tartrate (0.5-4.0 mg/kg IM)
    - Meloxicam (0.5-1.0 mg/kg IM, PO)
- Fistula usually scabs within 7-14 d
- Debride scab & necrotic tissue and close once wound contracts

Common Bird Emergencies: Other Burns

- Scalds, electrical, fire entrapment
  - If > 50% of body surface burned, poor prognosis
    - Complications: sepsis, renal failure, ischemic tissue necrosis
  - If smoke inhalation:
    - Provide oxygen
    - Place air sac tube if suspect laryngeal edema/ upper airway secretions



Other Burns

- If severe:
  - Provide fluids IV, IO – initial 20-30 ml/kg bolus if in shock
  - Administer systemic bactericidal antibiotics
  - Offer pain relief
    - Butorphanol tartrate (0.5-4.0 mg/kg IM)
    - Meloxicam (0.5-1.0 mg/kg IM, PO)
  - Monitor
    - PCV/TS – may become anemic & hypoproteinemic
    - Renal function (droppings, uric acid concentration)
    - Electrolyte concentrations
    - Wbc count: initially increases over first 24-48 hr

Other Burns

- If severe:
  - Apply cool compress (30 min.) to dissipate heat if recent burn
  - Flush superficial burns with dilute chlorhexidine
  - Sedate & debride necrotic tissue daily
  - Bandage with topical antibiotic (silvadene cream) +/- sterile dressing
  - Close large clean wounds when appropriate

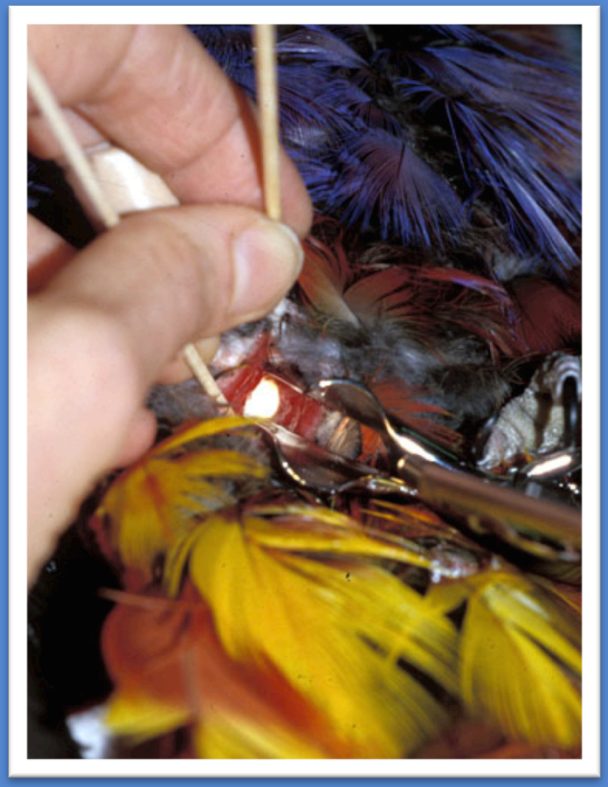
Common Bird Emergencies: Bloody Droppings

- Stabilize
  - Check PCV if mucus membranes are pale
  - May be weak from dehydration or anemia
  - Transfuse if severely (PCV < 20%) or acutely anemic
  - Provide fluids IV, IO, SC
  - Administer iron dextrans & B vitamins
  - Administer antibiotics
  - Administer Ca EDTA, DMSA if heavy metal toxicosis
  - Gavage feed if anorexic
  - Perform fecal cytology - confirm rbcs in droppings
  - With egg binding/laying –
    - Give calcium gluconate & vitamin D3 (1000 IU/ 300g BW IM once)
    - Reduce oviductal/cloacal prolapse

- Diagnose – when stable (fecal Gram's stain/culture/float, CBC, chemistry, EPH, heavy metal levels, radiographs)

Common Bird Emergencies: Cloacal/ Oviductal Prolapse

- Treatment
  - Provide fluids IV, IO, SC
  - Administer antibiotics if prolapse necrotic/ inflamed
  - Examine cloaca
    - Sedate with isoflurane
    - Identify prolapse as cloaca or oviduct (longitudinal striations)
    - Flush prolapse with warm saline
    - If tissue is healthy, apply sterile lubricant, replace with sterile swabs, +/- place 2 transverse retention sutures perpendicular to vent (not purse-string)
    - If tissue is necrotic, excise before replacing



Cloacal/Oviductal Prolapse

- Egg binding - treatment
  - If oviduct prolapsed but egg is not within prolapse:
    - Give parenteral calcium, vitamin D, fluids, antibiotics
    - Radiograph - determine position & size of egg
    - Lubricate & replace healthy oviduct
    - Debride necrotic tissue
    - Provide a warm (85˚-95˚F) humid environment
    - Decrease further egg laying with leuprolide acetate (900-1000µg/kg IM q 21-30d)
    - Place Deslorelin implant (4.7 mg SC q 4-6 months)

Cloacal/Oviductal Prolapse

- **Egg binding - treatment**
  - **If bird unstable or egg is not passed within 24 hrs after oviduct is replaced:**
    - **If egg is visible through cloaca, manually extract with gentle pressure on abdomen to move egg to vent**
    - **If unsuccessful, implode egg & aspirate with 18- to 22-ga. catheter inserted into egg through cloacal opening**
    - **If can't see egg through cloacal opening, perform percutaneous centesis of egg against body wall (last resort)**

Cloacal/Oviductal Prolapse

- Egg binding - treatment
  - If oviduct torsion, rupture, adhesion, or soft-shelled eggs that will not pass, laparotomy +/- salpingohysterectomy may be necessary
  - If ascites from egg rupture or egg yolk peritonitis, perform diagnostic/therapeutic coelomocentesis

Common Bird Emergencies: Fractures

- Place temporary bandage to stabilize fracture
- Offer supportive care (fluids, antibiotics, gavage feeding, pain relief, pad cage/low perches)
- When bird is stable, radiograph & attempt fracture repair with surgery or splint

Common Bird Emergencies: Bite Wounds

- Even small bites ⇒ sepsis
- Flush animal bites & scratches with dilute chlorhexidine
- Administer antibiotics
  - Cefotaxime (75 mg/kg IM q 8h)
  - Amoxicillin with clavulonic acid (125 mg/ PO q 8-12h)
- Offer pain relief
  - Butorphanol tartrate (0.5-4.0 mg/kg IM)
  - Meloxicam (0.5-1.0 mg/kg IM, PO)
- Flush & close large, fresh wounds
- Flush, debride, & bandage older wounds
  - Wet to dry bandages, changed daily
  - Close at later time
- If bird septic: IV fluids & antibiotics

Common Bird Emergencies: Self-mutilation

- Secondary to behavioral & medical problems
- Usually a chronic problem, but ensure bird stable (fluids, stop bleeding, etc.) before diagnostic tests
- Diagnose – when stable [CBC, chemistry, EPH, viral testing (PBFD, polyoma), radiographs, fecal Gram's stain & cytology, skin & feather biopsies]

Self-mutilation

- Treatment
  - Culture, flush, & debride wounds
  - Administer systemic and topical antibiotics (silver sulfadiazine)
  - Offer pain relief
    - Butorphanol tartrate (0.5-4.0 mg/kg IM)
    - Meloxicam (0.5-1.0 mg/kg IM, PO q 24h)
    - Gabapentin (10-20 mg/kg PO q 12h)
  - Collar/bandage to prevent further mutilation
  - Ensure adequate diet, stimulation, exercise, sleep
  - If severe mutilation unresponsive to other treatment, administer psychotropic drugs
    - Haloperidol (0.2 mg/kg q 12h if BW<1kg, 0.15 mg/kg q 12-24h if BW>1kg)

Common Bird Emergencies: Hemorrhage

- Secondary to trauma, infection, metabolic or nutritional disease, neoplasia
- Internal or external
- Stabilize first:
  - Check PCV/TS
  - If severe hemorrhage, give fluids IV or IO
  - If PCV < 20 %, consider transfusion
  - Apply manual pressure to bleeding sites
  - Monitor PCV over next 24 hours

Hemorrhage

- Broken blood feather
  - Pull broken feather at base, apply pressure
  - DO NOT use styptic powder or silver nitrate on feather follicles or skin ⇒ permanent feather & skin damage; toxic drug absorption
  - If follicle still bleeds, apply tissue glue
- Broken nails
  - Apply styptic powder or silver nitrate
- Broken beak
  - Apply pressure, thermal or chemical cautery (then rinse off after clotted)
  - File broken surface smooth to decrease bleeding

Common Bird Emergencies: Poisonings

Lead

- Clinical signs: neurologic (incoordination, seizures), gastrointestinal (anorexia, regurgitation, bloody droppings), renal (biliverdinuria, hemoglobinuria in Amazon sp.)
- Hematologic findings: anemia, polychromasia, anisocytosis
- Histologic findings: perivascular edema, nerve necrosis & demyelination, renal tubular necrosis

Poisonings

Lead

- Blood lead > 10 μg/dl suggests toxicosis
- Treatment
  - Give fluids: SC, IV, IO depending on condition
  - Administer anticonvulsants if seizuring
  - Chelate
    - Calcium disodium versenate (30mg/kg SC q 12h)
    - Dimercaptosuccinic acid (25 mg/kg PO q 12h)
  - Administer cathartics: Mg sulfate (epsom salt) to precipitate metal in GI tract (pinch in gavage feeding)

Poisonings

Zinc

- Affects liver, kidneys, pancreas
- Clinical signs: asymptomatic, weakness, neurologic signs, GI signs (foamy, fluffy droppings)
- Blood zinc > 200 μg/dl is diagnostic
- Treatment
  - See lead toxicosis

Poisonings

Pesticides

- Organophosphates, carbamates in insecticides
- Ingested in contaminated food & water
- Clinical signs from inhibition of acetylcholinesterase
  - Anorexia
  - Weakness
  - Neurologic signs
  - Bradycardia
  - Dyspnea

Poisonings

Pesticides

- Diagnosis: cholinesterase assay from blood
- Treatment
  - Atropine (0.2 mg/kg IM q 3-4 hr PRN)
  - Pralidoxime chloride (2-PAM) (10-20 mg/kg, repeated in 10-20 hr) for immediate organophosphate ingestion
    - Toxic to raptors

Poisonings

Anticoagulant rodenticides

- Warfarin, brodifacoum, bromodoline
- Vitamin K antagonists
- Clinical signs
  - Depression
  - Anorexia
  - Hemorrhage subcutaneously & from feather follicles
  - Oral & cloacal petechia
  - Bloody nasal discharge

Poisonings

Anticoagulant Rodenticides

- **Treatment**
  - **Administer vitamin K1 (0.2-2.2 mg/kg) SC, IM q 4-8 hr until stable, then SC, PO, IM daily for up to several weeks (slow rodenticide metabolism)**
  - **Transfuse**