

Avian Nursing: Critical Care & Anesthesia

A white dove is shown in flight, centered in the lower half of the image. Its wings are spread wide, and it is facing forward. The background is a clear, bright blue sky. The dove's feathers are white and appear soft and detailed.

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What constitutes an emergency?

- Hemorrhage/Trauma
- Difficulty Breathing
- Trouble Perching
- Inappetence
- Coelmic Distention
- “Fluffed Bird”



Supportive Care

Prioritize/Stages

Provide

- Warmth
- Oxygen rich environment

Physical Examination

Diagnostics

Supportive Therapy

- SQ fluids
- Gavage feeding

Calculate Emergency Drugs



Emergency Drugs

- Atropine
 - 0.01- 0.4 mg/kg
 - 0.5 mg/kg CPR
- Glycopyrolate
 - 0.01– 0.02 mg/kg
- Epinephrine
 - 0.1 – 0.5 mg/kg
- Doxapram
 - 2 - 5 mg/kg
- CPR should always be attempted but may not always be successful



Emergency Drugs

Atropine & Glycopyrrolate

➤ Bradycardia

Epinephrine

➤ Reverse cardiac standstill

Doxapram

➤ Respiratory stimulant



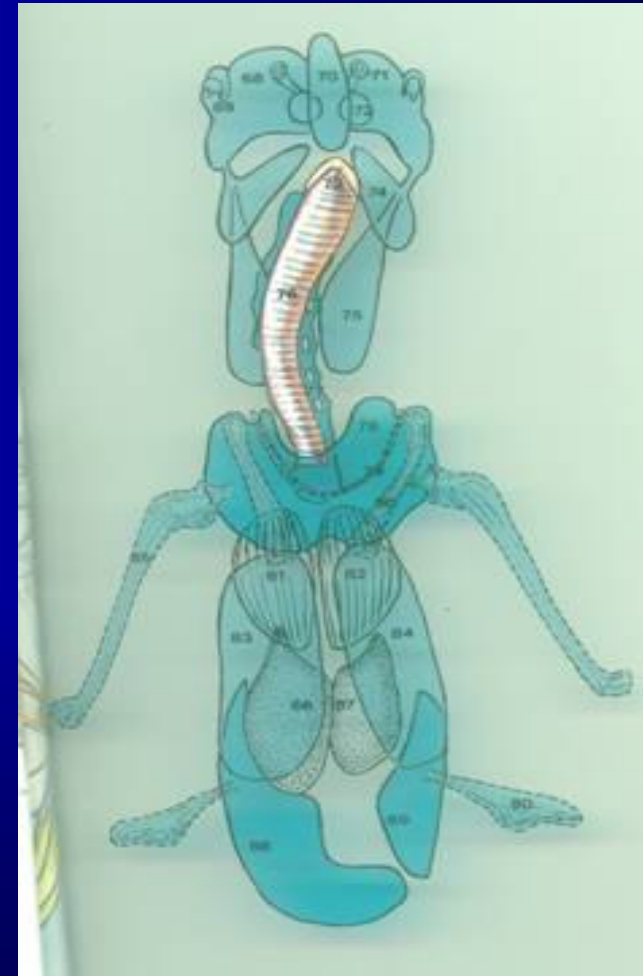
Unique Respiratory System

- Large respiratory capacity.
- Needs keel movement for air exchange.
 - Careful with restraint during induction.



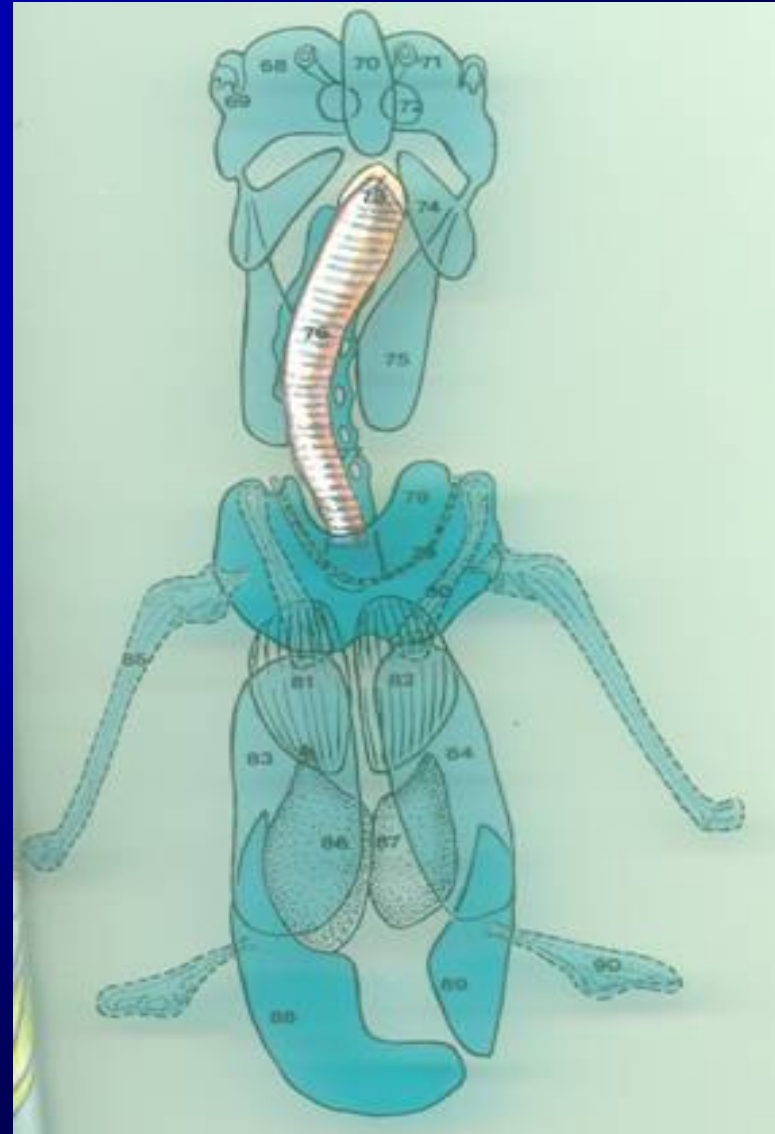
Normal Psittacine Respiratory Tract

- One unpaired
 - Clavicular
- Four paired air sacs
 - Cervical
 - Cranial and caudal thoracic
 - Abdominal
- Large respiratory capacity
- Needs keel movement for air exchange



Air Exchange

- ▶ Lungs are rigid located dorsal near spine.
- ▶ Oxygen exchange with both inspiration and expiration.
- ▶ Oxygen exchange with constant flow of air.
- ▶ Death occurs rapidly with apnea.



Respiratory Distress

Signs

- Tachypnea
- Open mouth respirations
- Auditory respirations
 - wheezes
- Collapse

Treatment

- Oxygen cage
- Limit :
 - stress
 - handling
- Warmth
- Cage
 - Dark & quiet

Tracheal Obstructions

- Tumors
- Papillomas
 - glottis
- Granulomas
- Transtracheal membranes
- Aspirated foreign body
 - seeds
 - splinters
 - pieces of toys



Air Sac Cannula Placement

Beneficial for tracheal obstructions

Caudal thoracic or abdominal air sacs

Right lateral recumbency

Insert caudal to last rib in flank region

Cannulas

- Short ET tubes
- Sterilized red rubber tubing, IV tubing
- Cook brand air sac catheters



Bleeding Emergencies

Causes

- Broken blood feathers
- Broken toe nails
- Traumatic injury

Treatment

- Direct Pressure
 - wounds
 - blood feathers
- Styptic powder or sticks
 - broken toe nails
- Pressure bandages
 - careful not to hinder respiratory effort

Broken Blood Feather

treatment

- Locate the broken blood feather
- Remove the feather using hemostats or needle-nosed pliers
- Pull in the same direction that the feather is growing
- Apply direct pressure to the feather follicle if bleeding continues



Coelomic Distention

Causes

Fluid

Mass formation

➤ egg stasis

Proventricular or ventricular distension

Respiratory distress

➤ may need oxygen support before exam



Egg Retention

Signs

- Fluffed bird
- Straining to defecate
 - scant or absent feces
- Coelomic distention
- Lameness
- Inappetence
- Regurgitation



Egg Retention

Causes

- Calcium metabolic disease
- Malformed eggs
- Excessive egg production
- Previous oviduct damage or infection.
- Nutrition insufficiencies

Treatment

- Fluid therapy
- Supplemental heat & humidity
- Lubricating the cloaca
- Calcium supplementation
- Vitamin supplementation
- Imploding the egg
- Surgical removal

Prolapsed Cloaca

- Egg, papillomas or other masses
- Irrigate tissue to remove debris
 - gently wipe away adherent
- Lubricate with K-Y Jelly
- Line bottom of cage with towels moistened with sterile saline



Fractures

Causes

- Attacked by larger animal
- Caught in cage toys
- Leg band caught
- Falls
- Flying into windows & ceiling fans



Fractures

Treatment

- Minimal stress
 - Dark & quiet environment
 - Pad the cage well
- Stabilize the fracture
 - Robert Jones
 - Figure-of-Eight



Head Trauma

- Dark, quiet and cool environment
- Watch closely for:
 - seizures
 - head tremors
 - circling



Animal Bites

- Cat vs bird
 - *Pasteurella multocida*
- Antibiotic therapy needs to be started ASAP
- Penetrating wounds may communicate with air sacs
- DO NOT FLUSH IF YOU ARE UNSURE WHERE THE WOUND GOES



Seizures

- Mild: disorientation, inability to perch
- Generalized: vocalizing, wing flapping and paddling
- Partial: persistent twitching
- Keep bird from injuring self or others
- Keep bird quiet and in dark cool place

Crop Burn

- ▶ Hand-fed neonates
 - ▶ Microwaved formulas
 - ▶ Hot spots
- ▶ Right ventral portion of crop
- ▶ Fistula
 - ▶ Starvation
 - ▶ Dehydration
- ▶ Surgical closure





Burns

- Commonly feet & legs
- Flush with copious amounts of cool water or saline
- Remove surrounding feathers
- Don't use greasy or oily medications
- Silver Sulfadiazine topically

Oil

- Disrupts thermoregulatory system resulting in hypothermia
- Blockage of nares & conjunctivitis
- Systemic toxicity & GI upset
- Prevent hypothermia
- Remove oil from nares, eyes & mouth
- Wash with dish washing detergent-DAWN
- Dry thoroughly

Scenarios Requiring Anesthesia

Physical exam

Diagnostics

- Blood collection
- Radiographs

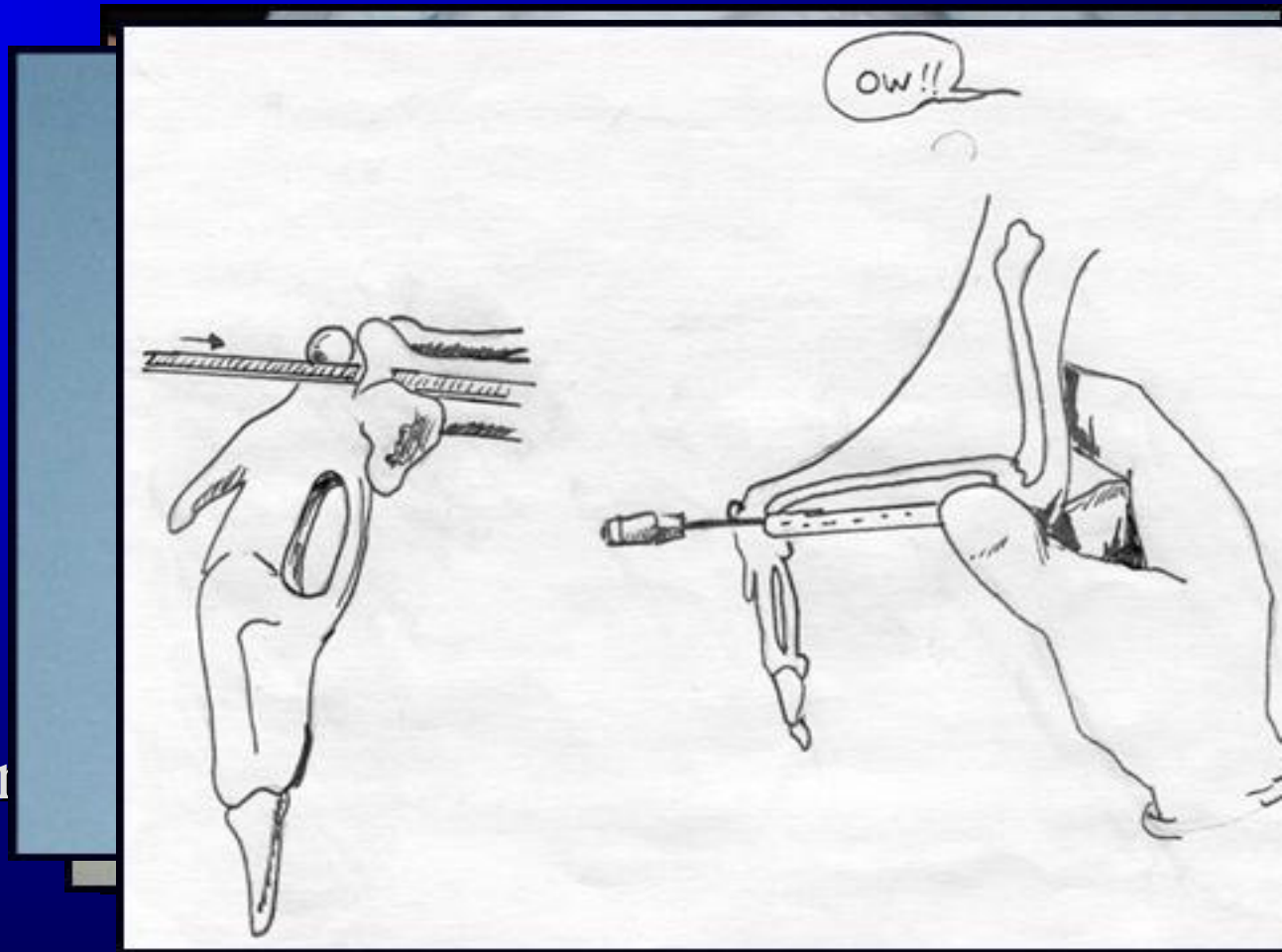
Minor procedures

- Microchipping
- Bandaging
- Leg band removal

Intraosseous catheter

Minor surgeries

Major surgeries



Pre-Anesthetic Considerations

- Elective procedure?
 - Microchipping
 - Radiographs for health screen
- Space occupying masses?
 - Obesity
- Major health problems?
 - Coagulopathy
 - Systemic disease
- Last ditch effort to save life?



Blood Transfusion



- Hematocrit $< 20\%$.
- Donors of same species is ideal.
- Donors of same genus is safe & efficacious.
- Finding donors can be problematic.
- Cross matching should be performed.
- Major and minor cross matching.
- Blood replacement products.
 - Oxyglobin.

Anesthetic Plan of Action

- Have everything ready prior to capturing the patient.
 - Light source/oral speculum.
 - ET tubes.
 - Tape strips.
 - Monitoring equipment.
- Have everything within hands reach.
- Create a check-off list.

Anesthesia Check-off List

Induction chamber

Stethoscope

Face mask

Laryngoscope handle & blade

Trans-illuminator

Oral speculum

ET tubes & sterile lube

Tape strips to secure ET tube

Humid-vent ®

ECG

Doppler w/ cuffs

Pulse oxymetry

Heating pad

Bair hugger & blanket

Fluid pump

IV catheters & fluids

Heparinized saline

Tissue glue & suture

Emergency drugs

Emergency Drugs

- Atropine
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Fasting Times

Decreases regurgitation and passive reflux.

- Small birds: 1-3 hours.
- Medium birds: 3-5 hours.
- Large birds: 6-12 hours.

Gavage feed electrolyte solution.

- LRS with Dexrose.
- Lafeber's Carbo-Boost.



Emergencies may not enable a proper fasting time.

Full crops can be emptied to prevent regurgitation.

- Preventing aspiration of crop contents.

Gavage Tube Placement

- ▶ Assistant restrains the bird
- ▶ Speculum or gauze strips to open mouth
- ▶ Enter oral cavity from right commissure
 - ▶ Advance slowly
- ▶ Palpate the instrument in the esophagus and in the crop
- ▶ Remove fluid or food



Injectable Anesthesia

Not routinely used in birds.

Prolonged recoveries.

Drugs must be metabolized.

Not all have reversal agents.

Most combinations usually require supplemental gas anesthesia.

➤ Many combinations

➤ Ketamine & Xylazine

➤ Ketamine & Midazolam

➤ Ketamine & Diazepam

Pre-anesthetics

- Atropine & Glycopyrrolate not routinely used.
 - Slows GI motility.
 - Thickens respiratory secretions.
 - Increases risk of plugging ET tube.
 - We use only if bradycardia is suspected.
- For sedation/analgesia:
 - Midazolam 0.25 – 1.0 mg/kg.
 - Diazepam 0.5 – 1.0 mg/kg.
 - Butorphanol 0.5 – 4.0 mg/kg.



General Inhalation Anesthesia

Isoflurane & Sevoflurane.

- Rapid induction & recovery.
- High margin of safety.
- Precision vaporizer.

MAC =

- Isoflurane: 1.5-2.5%
- Sevoflurane: 3-4%

0.3% metabolized.

Reduced cardiac &
respiratory depression.

Monitoring is critical.

Be prepared.



Breathing System

- Non re-breathing circuit.
 - Ayer's T-Piece
 - Bain's circuit
- Minimizes:
 - Respiratory resistance.
 - Mechanical dead space.
- Reservoir bag.
 - 0.5L –1.0L
 - Side vent.



Oxygen Flow Rate

- ▶ Oxygen flow rate.
 - ▶ 1-3 L/min for mask induction.
 - ▶ 500 ml/min to 1 L/min.
 - ▶ Higher flow rates can cause tracheal trauma.



Air Exchange

- ▶ Lungs are rigid located dorsal near spine.
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- ▶ Death occurs rapidly with apnea.



Chamber Induction

- For the anxious patient
 - African grey parrots
- When restraint could be detrimental
- Pre-medication in combination works well
 - Midazolam 0.25 - 1.0 mg/kg
 - Diazepam 0.5 - 1.0 mg/kg
- Not without risks



Mask Induction

Use creativity with masks.

Cover beak and nares.

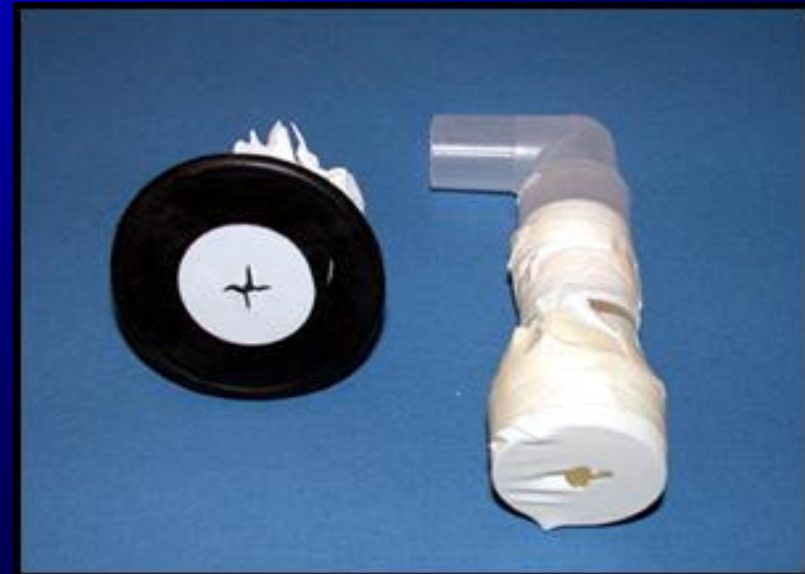
Slow induction tends to be the safest.

➤ 1-2% to start.

Monitor HR & RR the entire time of induction.

Wing, leg and beak tone are good indicators of anesthetic depth.

Bradycardia & apnea.





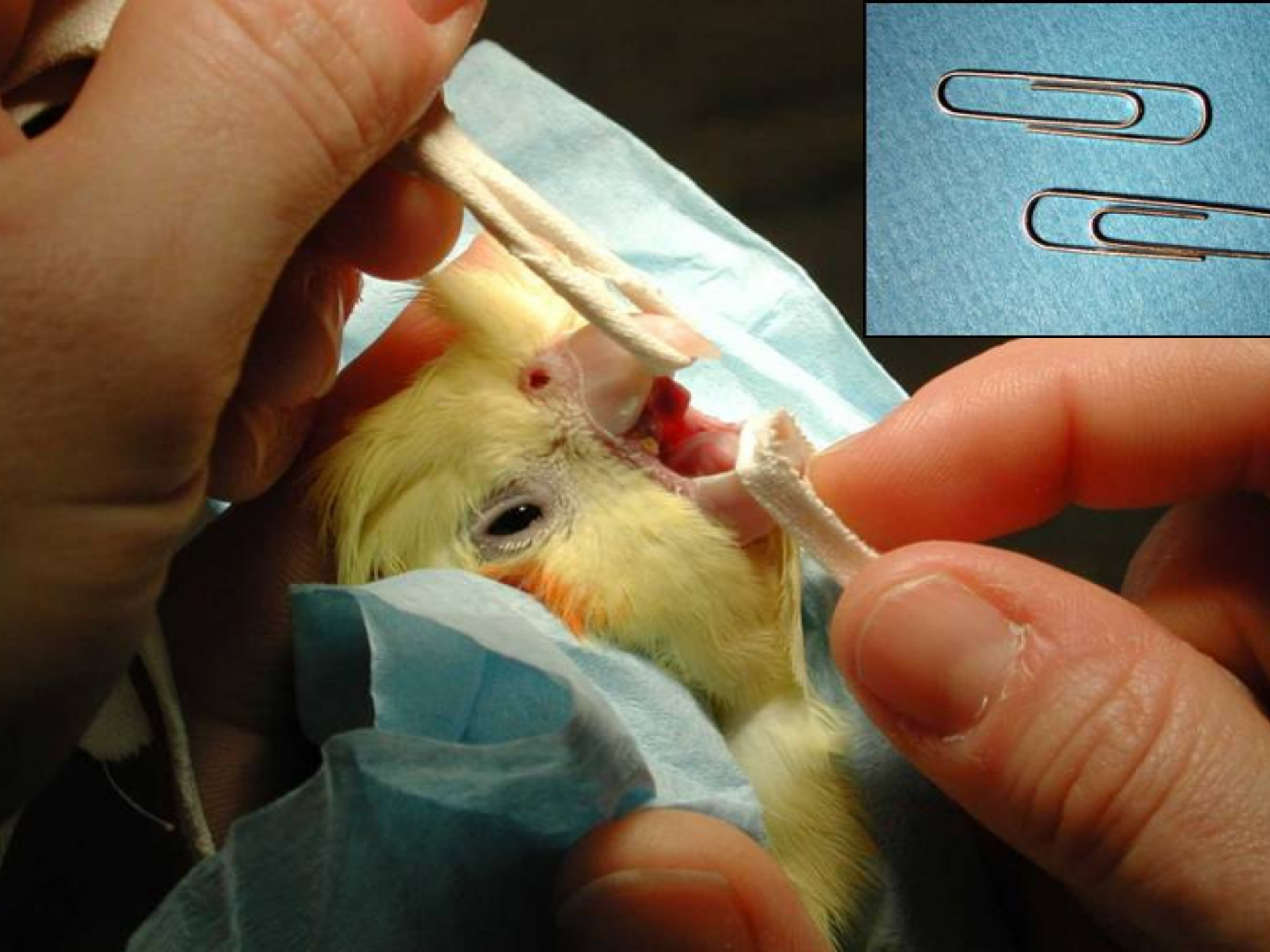




Accessing The Oral Cavity

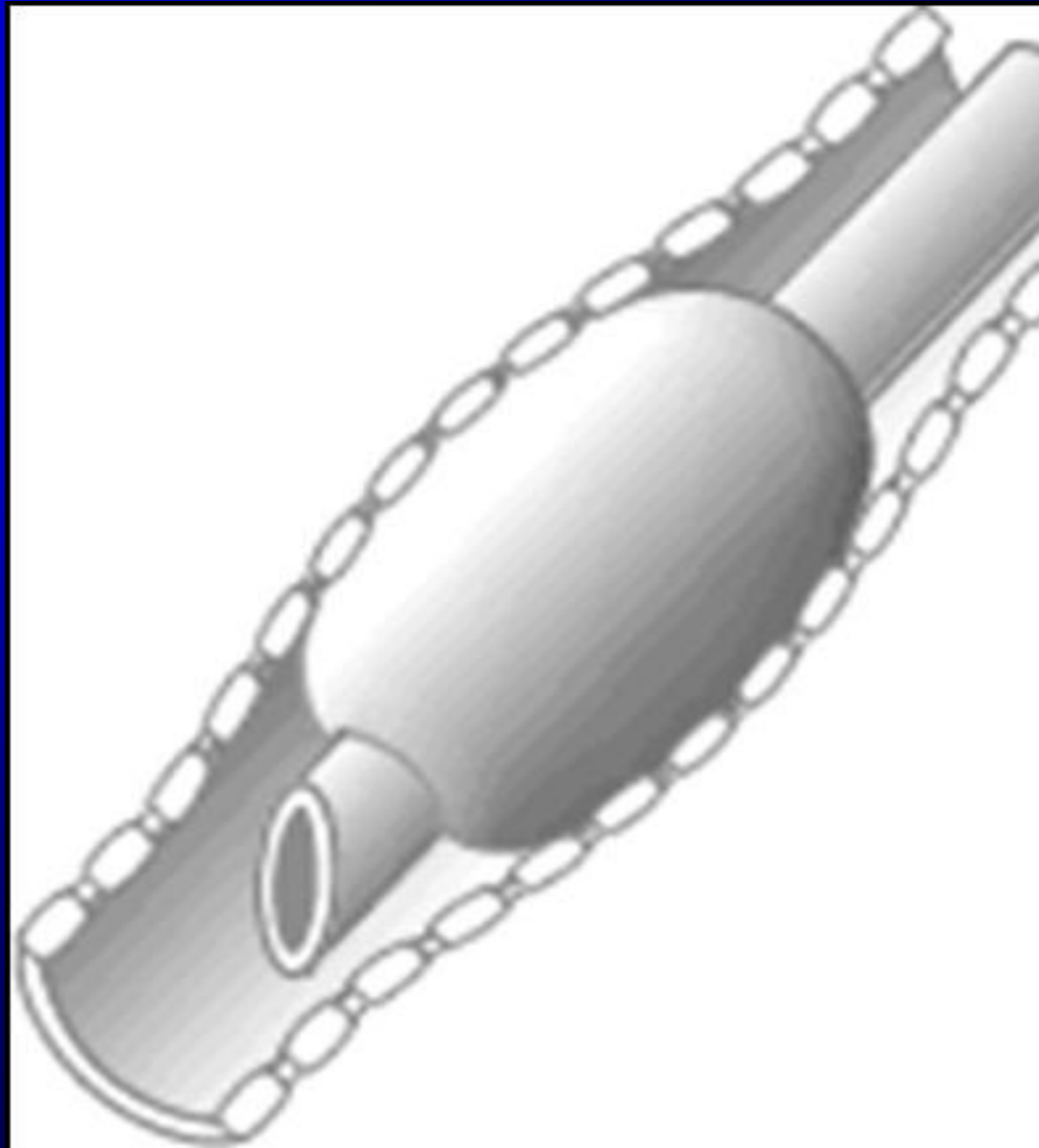
- Tape strips
- Gauze strips
- Paper clips
- Metal speculums





Intubation

- Fairly easy to do.
 - No epiglottis.
 - At base of short tongue.
 - Laryngeal scope.
- Complete tracheal rings.
 - No cuffed tubes should be used.
 - If cuffed tubes are used, don't inflate the cuff.





Ventilation

- Inadequate ventilation
 - Dorsal recumbency.
 - Obesity
 - Intra-coelomic masses
- Monitor respiratory rate and depth closely.
 - **Respiratory rate and effort**
 - Apnea monitor
 - Pulse oxysymetry
 - Blood gases



Ventilation

- Problems with respiration should be corrected quickly.
 - Decrease respiratory rate.
 - Shallow breaths.
 - Apnea.
- Apnea will occur several minutes before cardiac arrest.
- Cardiac arrhythmias can occur with poor ventilation.



IPPV & Ventilators

- ▶ Respiratory rate.
 - ▶ 10-40 breaths/min.
 - ▶ Regular rhythm.
- ▶ Assisted ventilation.
 - ▶ 8-15mm H₂O.
 - ▶ Too vigorous can cause trauma.



Mucous Plugs

- Anticholinergic side effects.
 - Thicken secretions can plug ET tube.
- Mucous plugs can create one way valve scenario.
- Plug airway entirely
 - Change ET tube.
- Watch excursions closely.
- Humid-vent can help.



Humid - Vent

Prevent over drying of trachea.

- Oxygen can be drying.
- Heating units.

Humidi-vents are used to prevent tracheal trauma by retaining moisture in the airway.



Monitoring Heart Rate

- Patient heart rate trends
- Stethoscope
- Esophageal stethoscope
- ECG
- Doppler

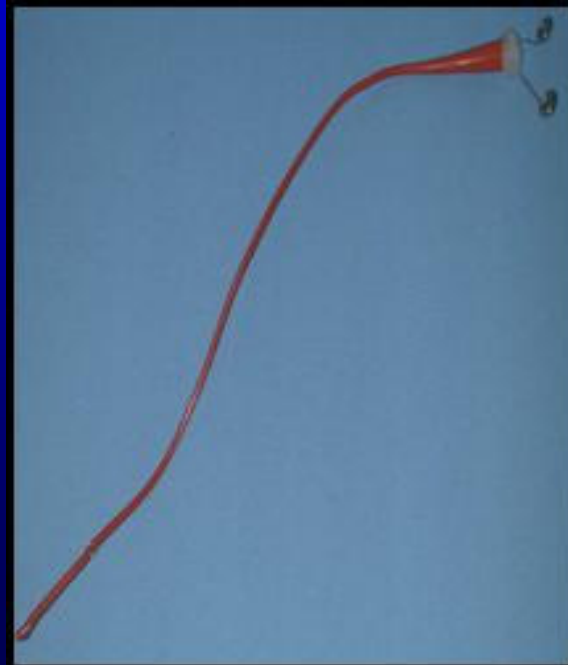


Ultrasonic Doppler Unit



Electrocardiogram

- Attaching the leads
 - Right arm
 - Left arm
 - Left leg
- Esophageal probe





Fluid Therapy During Anesthesia

- Essential for any lengthy procedure.
 - Unless blood loss is a concern.
- 10 - 60 ml/kg/hr.
- Crystalloid fluid.
 - LRS or NaCl.
- Syringe pump.
- Maintenance fluids SQ.



IV Access

Wing or basilic vein.

Leg or medial metatarsal vein.

Intraosseous.





ZOO MED

VSA



EUREKA, CA 94501

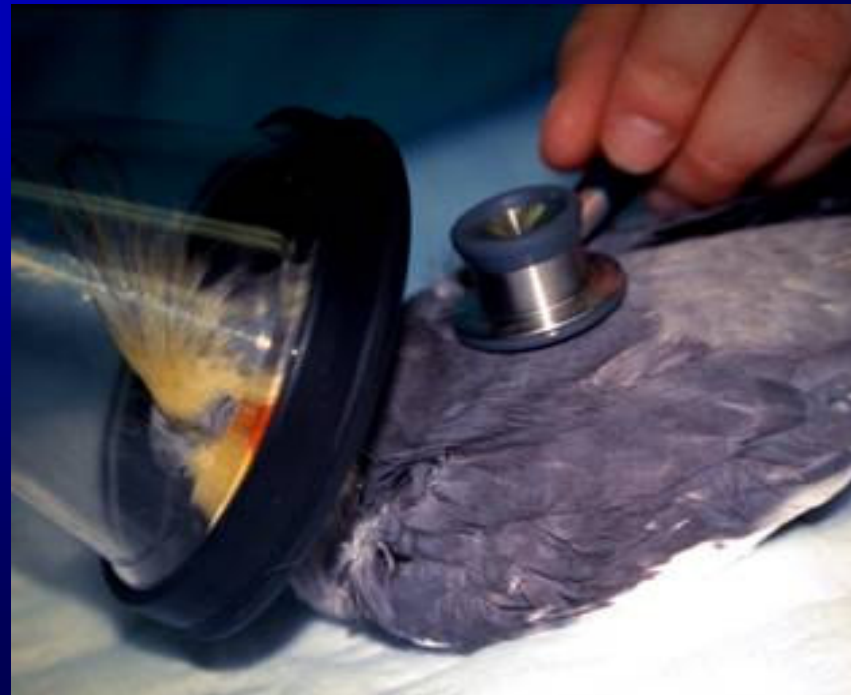


ZOO MED



Monitoring Patient Depth

- Wing tone
- Toe pinch
- Respiratory rate and effort
- Blood pressure



Body Temperature

- ▶ Normal 105-110 °F
- ▶ Patients core body temp drops during prep
 - ▶ Loss of feathers & alcohol prep
- ▶ Heating pads, lamps
- ▶ Hot water bottles
- ▶ Bair hugger unit
- ▶ Warm patients recover faster

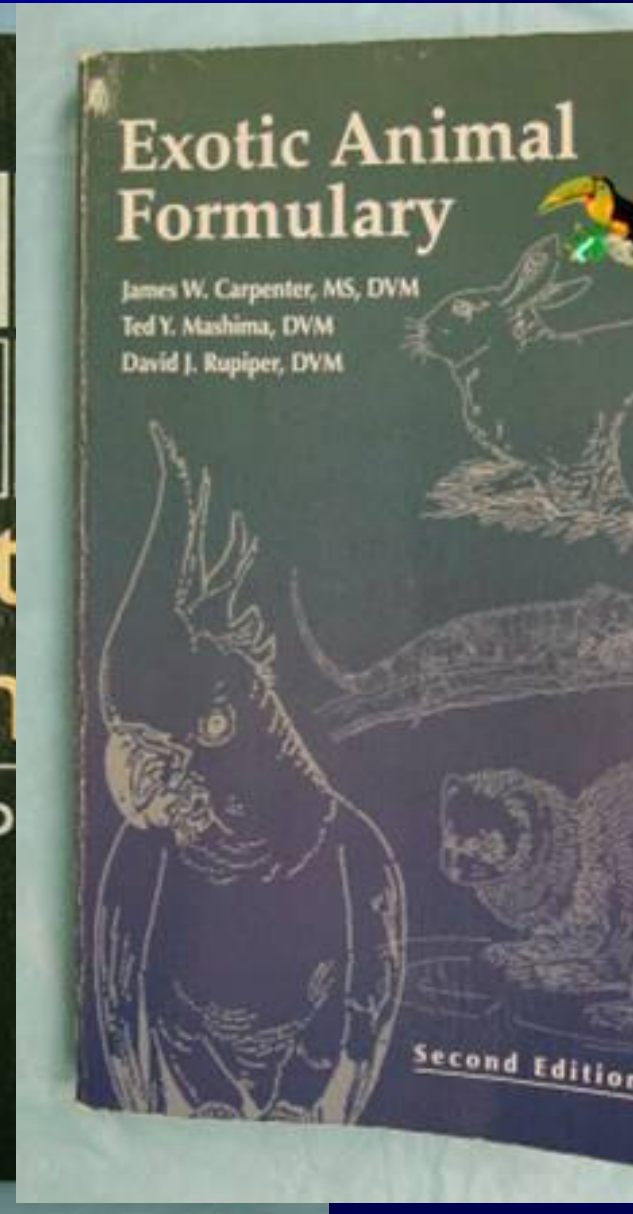
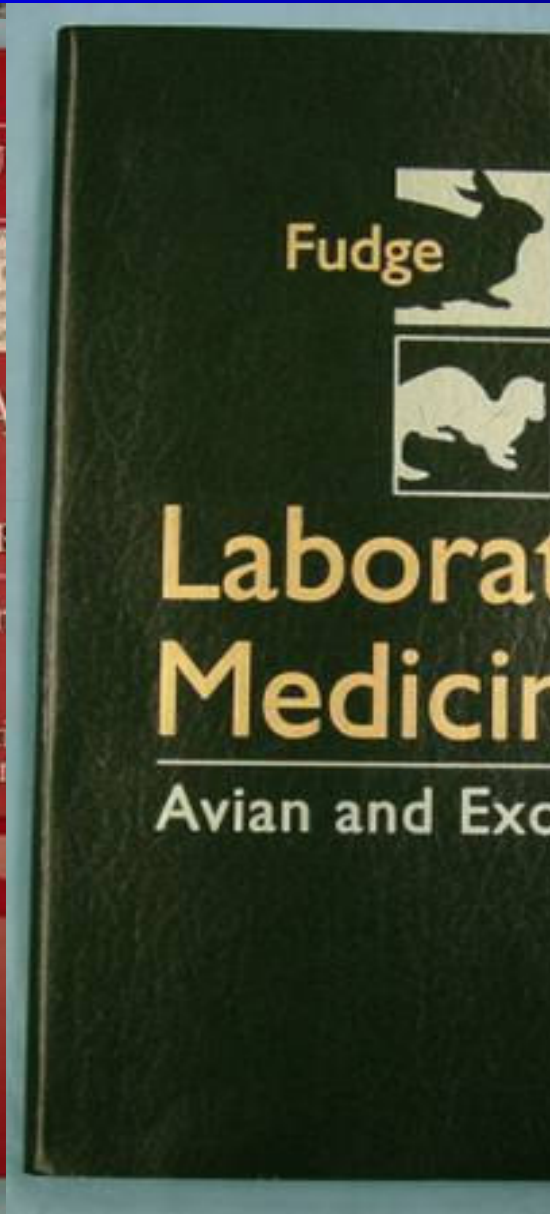
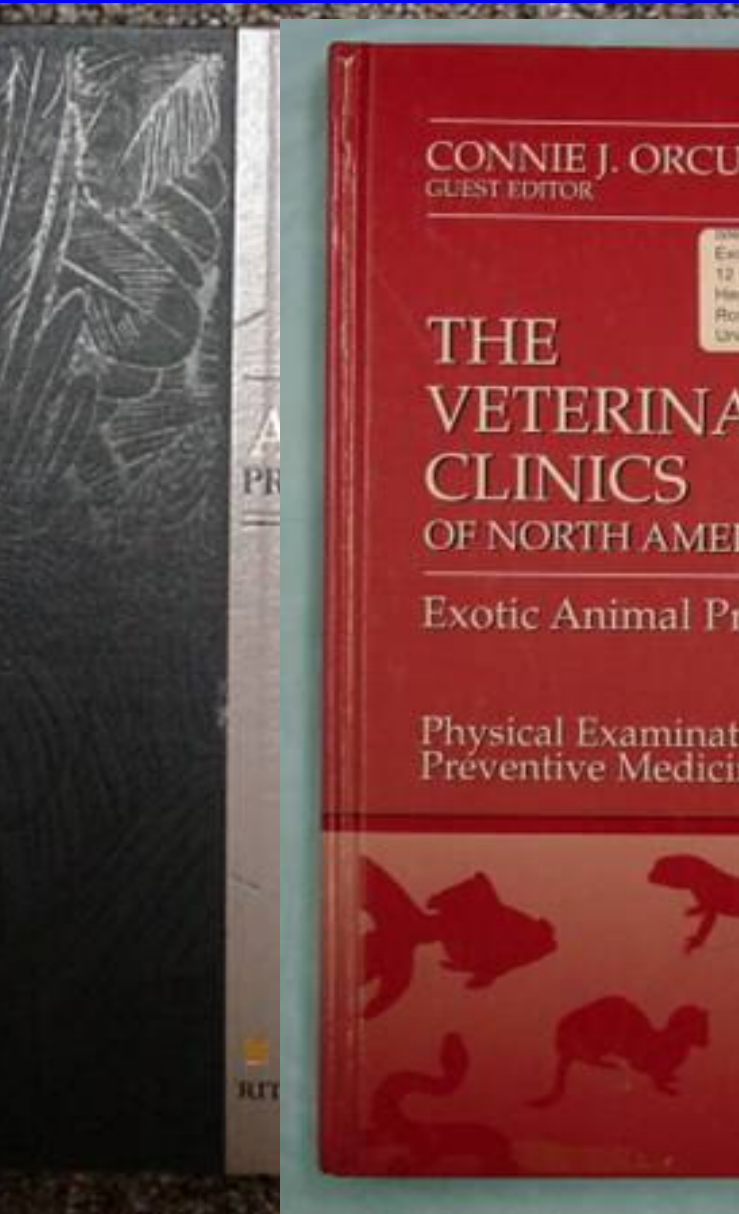


Recovery

- Monitor HR & RR very closely
- May need padded environment
- Oxygen cage
- Supplemental heat
- Analgesia
- SQ fluids if no IV available



References



Special Thanks!

- * AAHA
- * UC Davis
- * Faculty
- * Residents
- * Staff



The End

