

Exotic Animal Anesthesia



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Exotic Animal Anesthesia

- Small mammals

Ferrets, Rabbits, Rodents

- Birds

- Wildlife



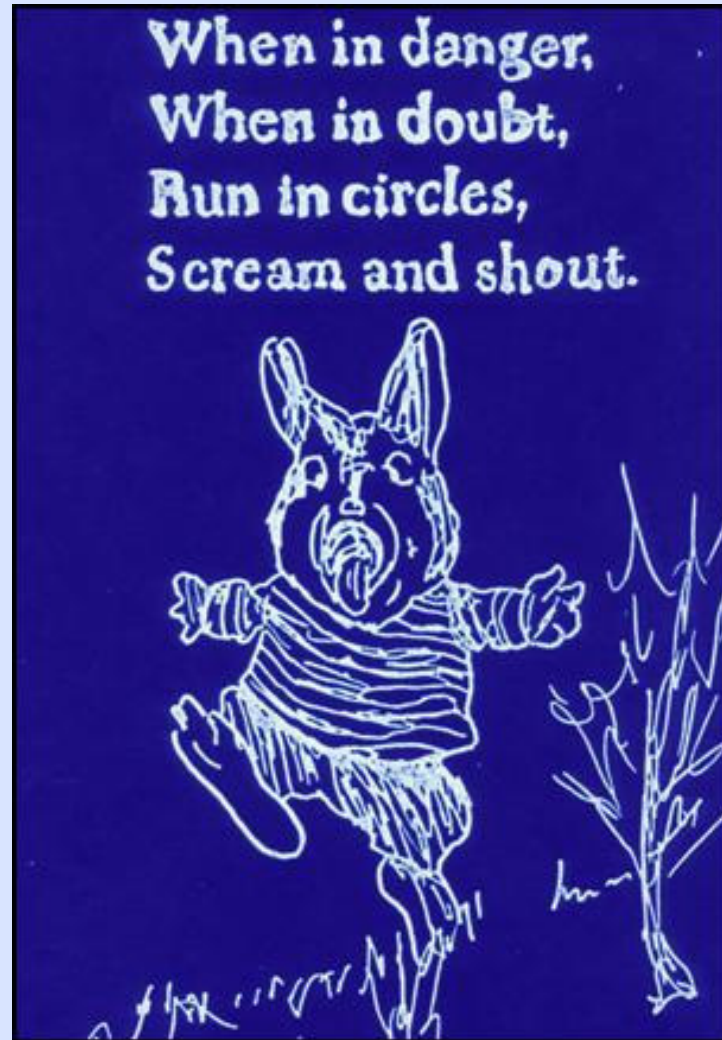
Ferret Anesthesia

- Similar to feline anesthesia
- Tendency to salivate with dissociatives
 - Anticholinergics
- Common Diseases:
 - Anemia, adrenal tumor, insulinoma, other endocrinopathies, lymphoma, cardiomyopathy
- Dissociative anesthetics
- Inhalant anesthetics

Ferret Anesthesia

- Thorough examination and history - as with conventional companion animals
- IM injection - thigh rather than lumbar
- IV access - cephalic, lateral saphenous, jugular
 - occasionally intraosseous
- Endotracheal intubation - tight jaws, but easy

Rabbit Anesthesia - “No Fear”



Rabbit Anesthesia - “Know Fear”



Rabbit Anesthesia - Respiratory Support

- Minimize dorsal recumbency
- Careful titration of anesthetics to effect
- Avoid apnea
- Common upper respiratory disease

- Ventilatory stimulation:
 - light pressure to lateral thorax, respiratory stimulant -
Doxapram 2-4 mg/kg, IV
- Ventilation - endotracheal tube with oxygen

Rabbit Anesthesia - Ketamine

- Ketamine (44 mg/kg) IM, for restraint or light anesthesia
- Ketamine (35 mg/kg) IM plus adjuncts for surgical anesthesia
- Atropinase activity in many (30-50%)
- Atropine optional (0.1-3.0 mg/kg, IM)

Rabbit Anesthesia - Ketamine

- Ketamine (20-40 mg/kg, IM) plus one of the following:
 - Xylazine (3-5 mg/kg, SC, IM)
 - Acepromazine (0.25-1.0 mg/kg, SC, IM)
 - Diazepam (1-5 mg/kg, IV)
 - Midazolam (1-2 mg/kg, IV, IM)
 - Buprenorphine (0.1 mg/kg, SC, IM, IV)

Rabbit Anesthesia - Telazol

- Inadequate metabolism reported - use with caution
- Telazol (5-10 mg/kg) IM for restraint or light anesthesia
- Telazol plus inhalant for surgical anesthesia
- Atropine optional (0.1-3.0 mg/kg, broad range) IM or SC

Rabbit Anesthesia -DKT

- IM lumbar muscles
- Domitor - 0.05 mg/kg
- Ketamine - 5 mg/kg
- Torbugesic - 0.2 mg/kg

Mask (or ETT) with oxygen + inhalant

- Antisedan for partial reversal

1/2 the volume of Domitor used, IM

Rabbit Anesthesia - Endotracheal Intubation

- "The difficult is not impossible!"
- Obstacles: tongue, skin folds, incisors, limited opening
- Direct visualization - laryngoscopy
- Guide cannula per os
- Retrograde intubation technique

Endotracheal Intubation of Unconventional Species:

- Size of tubes, unconventional materials
- Visualization of laryngeal opening
 - adequate anesthesia
 - laryngoscope
 - otoscope
 - "blind" methods
- Anatomic obstructions and variations.
- Intubation of small rodent usually not recommended - trauma, obstruction

Rodent Anesthesia - Basic Considerations

- Keep it brief, Keep them warm
- Minimize fluid (blood) loss
- Intravenous injection techniques - each species:
tail vein, penile vein, tarsal vein
- IP injections less traumatic than IM
 - but visualize needle tip
- Support body temperature
- Avoid toxicities, enzyme induction
- Pentobarbital (IP) as sole anesthetic
- Oral administration - gavage tube

Small mammal and rodent anesthesia

Obtain a weight

Provide a heat source

Taking temperature not always practical



The “writhing response”

- A transient squirming or swimming type motion during anesthesia
- Seen in guinea pigs, hamsters and gerbils
- Avoid misinterpretation and over-dose!

Mouse Anesthesia - Inhalant anesthetics

- Chamber induction - custom made to reduce volume
- Mask or Nose Cone - custom made to reduce “dead space” rebreathing

Mouse Anesthesia - Ketamine

- Ketamine (5 mg/100 gm, 50 mg/kg),
IM,
 SC, IP for restraint
- Ketamine Xylazine cocktail:
 1ml ketamine (100 mg) + 1ml xylazine (100 mg) + 8 ml saline
 Administer 0.05 cc per 10 gms body weight
- Induction time about 10 minutes.
- Duration of anesthesia usually 60-100 minutes (range 20-160 min).

Rat Anesthesia - Ketamine

- Restraint purposes: 20-60 mg/kg, IM
Preparation for other anesthetics
- Surgical anesthesia: 40-80 mg/kg, IM
Supplemented with other agents:
Xylazine (2-10 mg/kg, IM)
Other tranquilizers, sedatives,
analgesics

Rat Anesthesia - Telazol

- Restraint purposes: 20 mg/kg, IM, IP
Preparation for other anesthetics
- Surgical anesthesia: 20-40 mg/kg, IM, plus:
 - Xylazine (2-6 mg/kg, IM, IP)
 - Other tranquilizers, sedatives, analgesics
 - Atropinase activity in some rats

Rat Anesthesia - Pentobarbital

- 30-40 mg/kg, IV or 35-50 mg/kg, IP
- Variable requirements
- Dose-dependent depth and duration up to 1 hr.
- Factors influencing dose requirement
strain, age, sex, environment,
hepatic enzyme induction

Rat Anesthesia - Inhalant Anesthetics

- Injectable anesthetics for restraint or induction
- Inhalant chamber induction
- Chambers, face masks, nose cones customized
- Endotracheal intubation not often necessary, but possible

Hamster Anesthesia - Challenges

- Attitude - Tendency to bite
- Short tail - No useful tail vein
- Atropine use has been associated with cecal atony

Hamster Anesthesia - Ketamine

- Restraint: Ketamine
40-150 mg/kg IM or 100-200 mg/kg IP
poor relaxation and analgesia
- Anesthesia: Ketamine plus:
Xylazine (up to 10 mg/kg) IM or IP
or Diazepam (5 mg/kg) IM or IP
or Midazolam (1-2 mg/kg IM or IP

Guinea Pig Anesthesia

- Docile but easily frightened
- Cecum is voluminous (20-40% body weight)
fasting is recommended
gas-cap in cecum
- Anticholinergics to prevent salivation
- IP injections often penetrate viscera
- Cephalic or lateral saphenous veins
- Bronchial secretions - periodic airway suctioning
- Monitoring aid - ear pinch response

Guinea Pig Anesthesia - Injectables

- Atropine 0.05 mg/kg IM, SC
- Acepromazine 0.5-1.0 mg/kg IM, SC
- Midazolam 1-2 mg/kg IM, SC
- Xylazine 5-10 mg/kg IM, SC
- Ketamine (50 mg/kg) IM or IP for restraint only
- Ketamine (35-100 mg/kg) IM, IP with Xylazine (2-5 mg/kg) IM, IP

Avian Anesthesia



- A bird... is not a bird... is not a bird...
- Caution in restraint and examination
 - Particularly with sick or injured birds
- Unique respiratory system
- Unique anatomic features
 - Air sacs, pneumatic bones, etc.
- High metabolic rate



Physical exam

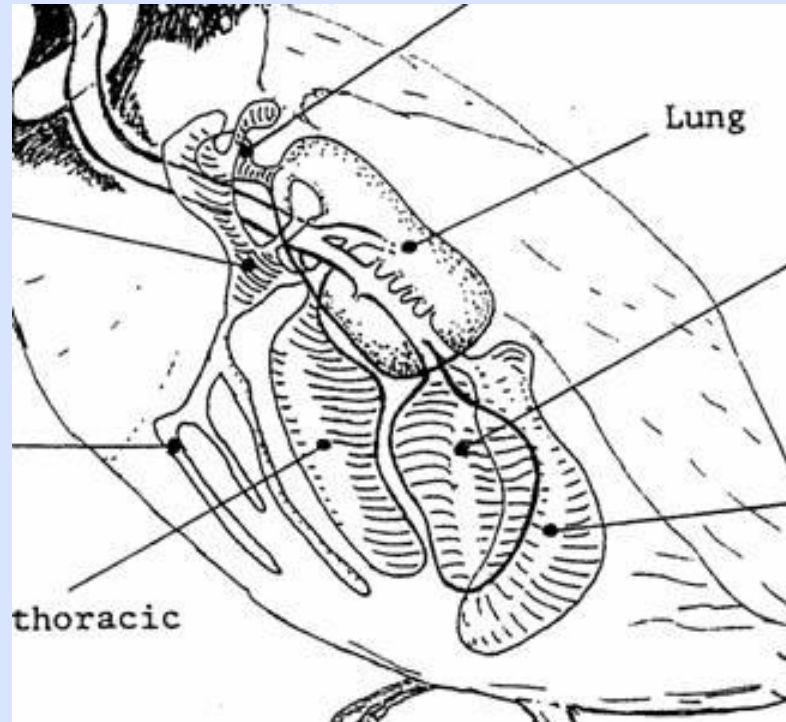
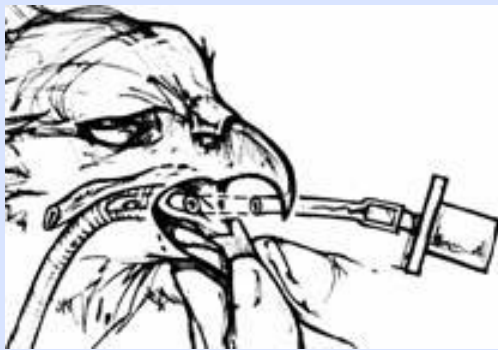


CAUTION!

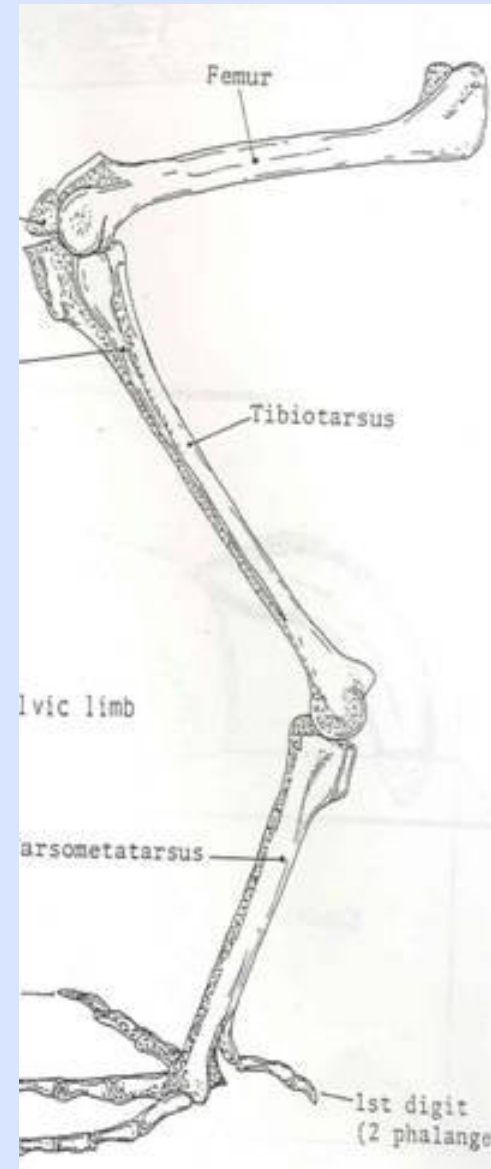
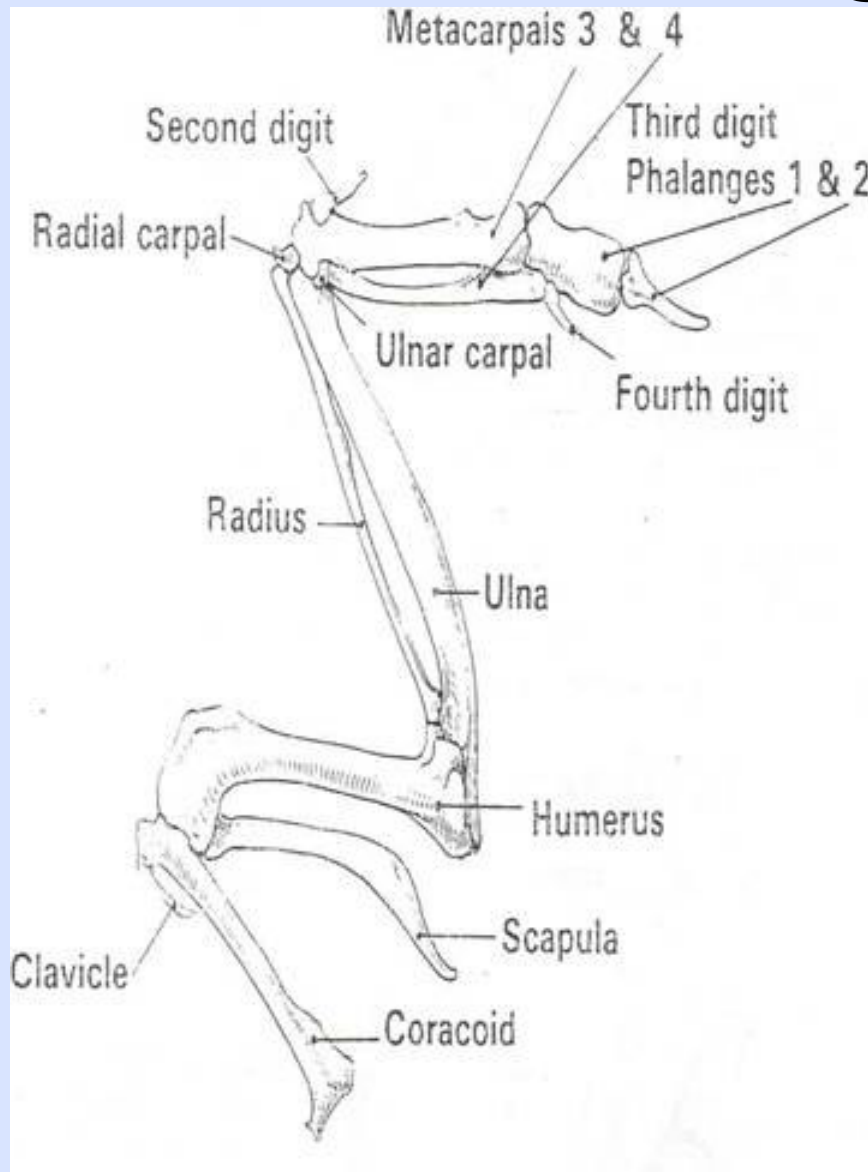
BIRDS DO NOT HAVE A DIAPHRAGM

**The sternum must be free to move or
suffocation will occur!**

Avian respiratory system



Avian wing and leg



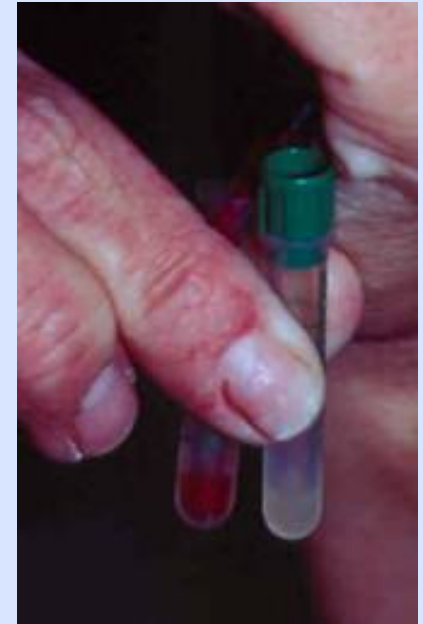
Venipuncture sites for avian blood sampling

- Jugular vein
- Basilic vein
- Leg veins in larger birds



Maximum blood sample amounts

- 1% of body weight in kg may be taken
- For example:
 - 100gm bird x 1% =
 - 100gm bird x 0.01= 1gm
 - 1 gm = 1 ml of blood
- **Caution: take less in debilitated birds**



Routes for avian fluid therapy

- **Subcutaneous**
 - **inguinal area**
 - **back**
- **Special precautions**
 - **avoid giving fluids in air sacs**
 - **always visualize bevel of needle**



Subcutaneous fluids

- **2.5% dextrose in Normosol R or LRS**
- **0.05ml of 50% dextrose per 1ml of fluid**
- **Initial SQ fluid dose 50ml/kg**
- **CAUTION: dextrose >2.5% HARMFUL**



Avian intravenous injection

- **Jugular vein**
 - more dominant on the right**
 - featherless on both sides**
- **Basilic vein**
 - ventral to the elbow**

Avian intraosseous catheters

- **Only 2 sites available**
ulna
tibiotarsus



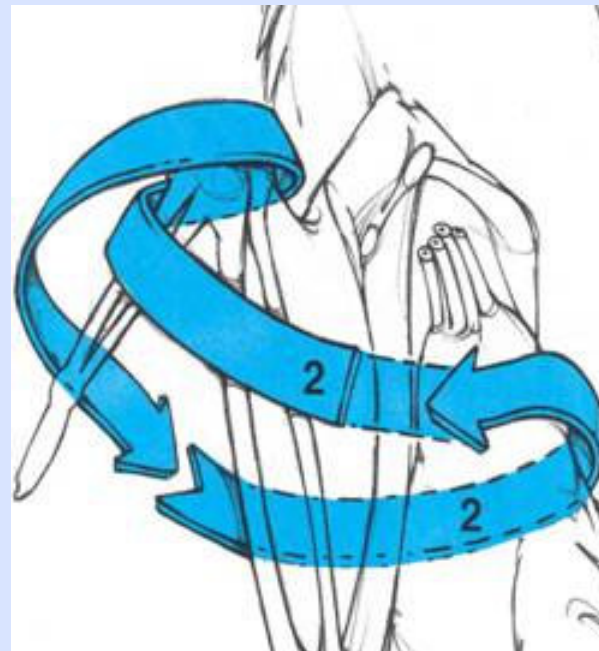
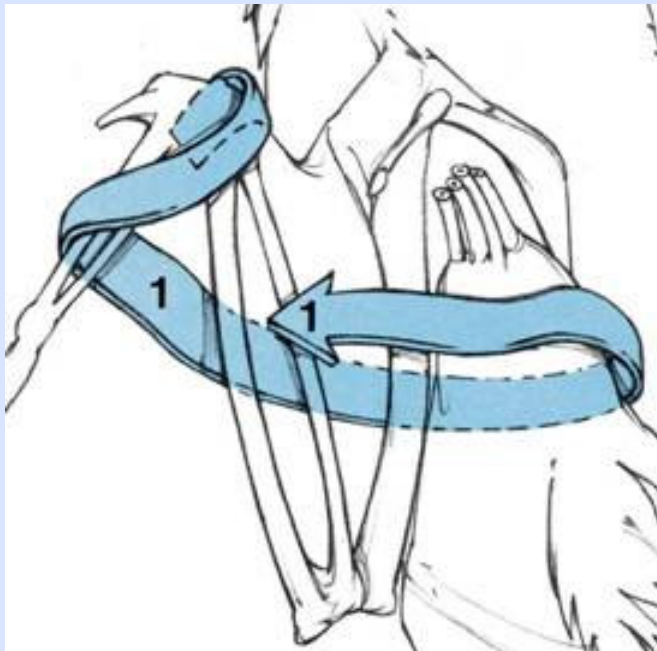
- **CAUTION: PNEUMATIC BONES IN BIRDS CONNECT WITH RESPIRATORY SYSTEM**

Intraosseous catheter technique

- **Pluck feathers**
- **Palpate condyle**
- **Rotate needle through condyle**
- **Thread up to hub**
- **Flush with Normosol to check placement**
- **Flush with small amount of hep-saline**

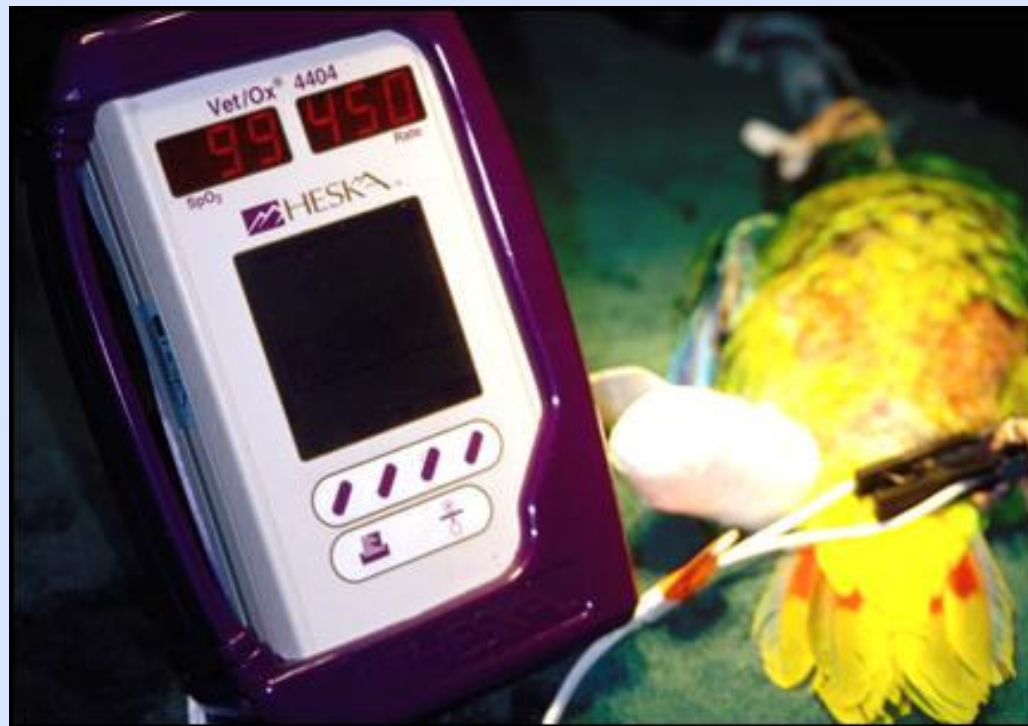
Bandaging intraosseous catheters

- Nexaban or suture into place
- Place a figure of eight bandage on wing
- Place a modified Robert Jones on the leg



CV Monitoring (perfusion of tissues)

- Pulse Oximetry





ULTRASONIC DOPPLER
FLOW DETECTOR
Model 311 S
Medical Technology, Inc.
10000 W. 10th Ave., Suite 100
Denver, CO 80202

Care of Orphaned/Injured Wildlife

Should We Do It ?



Human intervention

- **Kidnapping**
- **Heavy metal toxicity**
- **Cat and dog bites**
- **Hit by cars**
- **Flying into windows**
- **Pesticide toxicity**
- **Illegal shooting**
- **Fishing line**





Legal requirements for wildlife rehabilitation

- **TWRA request 200 hrs with a rehab facility**
- **Continuing education is encouraged**
- **Veterinarian must be listed**
- **Letters of recommendation**
- **Facility inspected**
- **USFW permit for migrating species**
- **Annual report to TWRA and USFWL**

Legal classes of wildlife

- **Class 1 – Dangerous – permit required**
- **Class 2 – permit required for rehabilitation**
- **Class 3 – no permits required**
- **Class 4 – permit required for rehabilitation**
- **special letter of permission needed**
- **Class 5 – special permit required**

CLASS 1

DANGEROUS TO HUMANS

- **Includes many zoo animals**
- **Venomous snakes**



It is more than maintaining life

Evaluate for potential release

Few are suitable for education animals

**Federal law prevents
wing amputations**



Restraint of Wild or Unmanageable Animals

- Safety of personnel is paramount
- Priorities in the delivery of medical care...
 - “Maintain cutaneous integrity!”
- Ketamine
- Telazol
- Xylazine - Other Alpha-2 agonists
- Super Opioids:
 - Etorphine (M-99), Carfentanil, etc





