WILDLIFE FLUID THERAPY

2025 FWRA
DR. JENNIFER BLOSS

BROOK-FALLS VETERINARY HOSPITAL & EXOTIC CARE
MENOMONEE FALLS, WI
EXOTICVET@EARTHLINK.NET

LAB AGENDA

Lecture:

Why, Where, and How Much?

fluid calculations

Lab:

Gavaging birds

SQ fluids – mammals, birds, reptiles

IO catheter insertion

PRINCIPLES OF FLUID THERAPY

MOST ANIMALS YOU WILL ENCOUNTER IN REHAB ARE DEHYDRATED as a result of:

Decreased fluid intake

Increased fluid loss

- Hemorrhage
- Diarrhea
- Vomiting/Regurgitation

DEHYDRATED WILDLIFE

Abandoned neonates

Acute trauma

From mild wounds to shock and hemorrhage

Chronic illness and malnutrition

Toxicosis

HYDRATION IMPACTS MAJOR BODY FUNCTIONS

BLOOD PRESSURE

Perfusion of major organs- brain, heart, liver, kidneys

BODY TEMPERATURE REGULATION

Hyperthermia and Hypothermia

ELIMINATION OF WASTE PRODUCTS

Via kidneys and GI tract

METABOLIC PROCESSES

Digestion, gut motility, immune response to injury/disease

WHAT DOES DEHYDRATION LOOK LIKE?

Skin tent prolonged > 2 seconds

Sunken eyes

Dry mucous membranes in mammals

Ropey saliva appearance, esp birds and reptiles

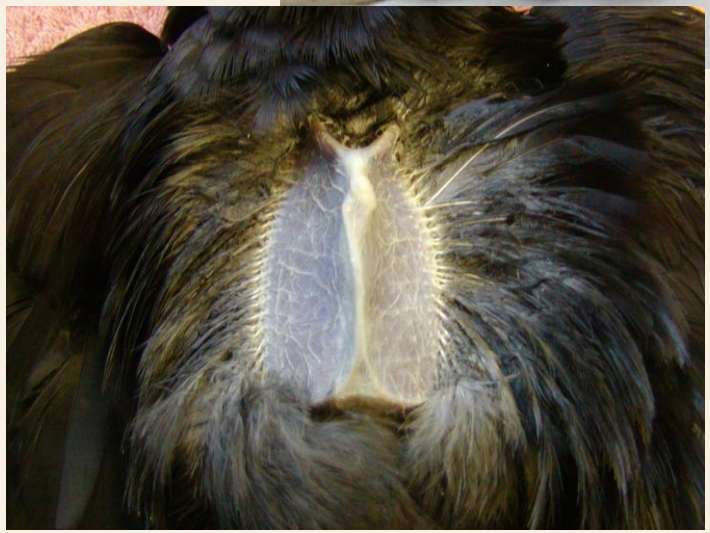
Increased capillary refill time > 2 seconds

Elevated heart rate

Weak pulse

Decreased temperature of extremities

INCREASED SKIN TENTING > 2 SEC



DRY OR PALE MUCOUS MEMBRANES

vs

INCREASED CAPILLARY REFILL TIME > 2 SEC

SUNKEN EYES

ROPEY SALIVA

TEMPERATURE AND COLOR OF EXTREMITIES

ASSESSING DEHYDRATION PERCENTAGE

- **5% (Mild dehydration)**

  -Subtle loss of skin elasticity

  -all rehab patients are considered to be at least 5% dehydrated even if they appear normal

- **7-8% (Moderate dehydration)**
  - Skin testing > 2 sec
  - prolonged capillary refill time > 2 sec
  - Mucous membranes may be dry or ropey
  - Eyes dull and sunken

ASSESSING DEHYDRATION PERCENTAGE

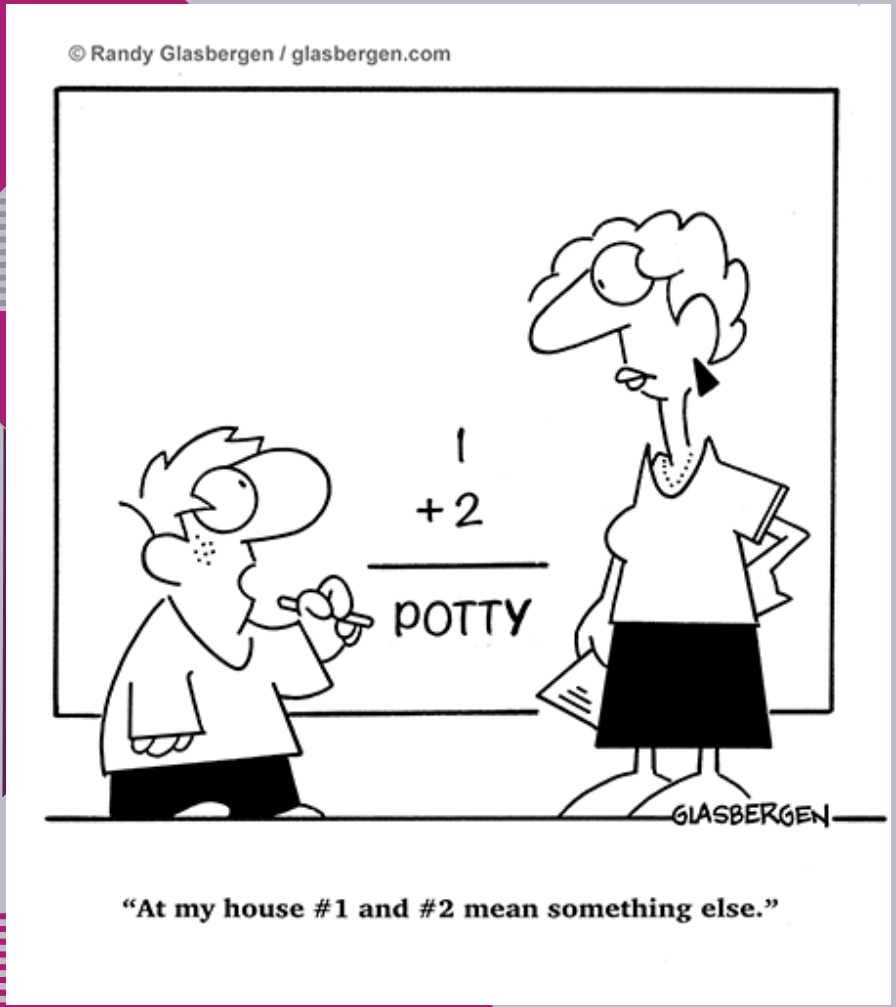
9 -12% (severe dehydration) - IV fluid therapy preferred

- Tented skin stands in place ≥ 3 seconds
- Prolonged CRT (>2s)
- Onset of shock: Increased heart rate, weak pulse, pale mucous membranes, flat veins, cold extremities

12-15% shock/moribund – IV fluid therapy preferred

- Skin turgor rigid- stays tented
- Very lethargic
- Presumed renal failure

HOW MUCH FLUID TO GIVE?



We can calculate that!

Don't "wing" it! Fluid overload can cause respiratory and cardiac failure!

CALCULATING FLUID VOLUMES

Maintenance need based on body weight in Kilograms Kg (NOT POUNDS OR GRAMS!!)

1Kg = 1 Liter 1 gram = 1ml

1000gms = 1 kg 1kg = 2.2 lbs

1. calculate total daily maintenance fluid needs

2. estimate degree of dehydration

3. calculate fluid deficit

4. Total daily fluid requirements = maintenance + deficit + ongoing losses (usually ignored except with diarrhea/ongoing blood loss)

DAILY MAINTENANCE FLUIDS

Reptiles = 10 – 30 ml/kg/day

Most Mammals = 40 - 60 ml/kg/day

Birds = 50 ml/kg/day

Mammalian neonates, Rabbits, and Rodents = 100 ml/kg/day

DAILY MAINTENANCE FLUIDS EXAMPLES:

10lb Raccoon

Convert from lb to Kg 1lb = 2.2 kg
divide lb by 2.2 to get Kg
10/2.2 = 4.54kg

Mammals are 40-60ml/day, will use 50ml
4.54kg x 50ml/day = 227ml/day maintenance needs

DAILY MAINTENANCE FLUIDS EXAMPLES:

80gm American Robin

8lb Virginia Opossum

2lb Cottontail Rabbit

DAILY MAINTENANCE FLUIDS EXAMPLES:

80gm American Robin

1. convert from gm to Kg 80gm= 0.080kg
2. 0.080kg x 50ml = 4mls per day maintenance

8# Virginia Opossum

1. convert from lb to Kg 8/2.2 = 3.64kg body weight
2. 3.64kg x 50ml = 182mls per day maintenance

2# Cottontail Rabbit

1. convert from lb to kg 2/2.2 = 0.9kg
2. 0.9kg x 100ml = 91mls per day maintenance

ESTIMATE DEGREE OF DEHYDRATION FOR FLUID DEFICIT

Fluid deficit based on weight in GRAMS

80gm American Robin severely dehydrated 10%
To multiply by a %, move decimal 2 places to the left)

80gms x 0.10= 8 ml deficit

8lb Virginia Opossum moderately dehydrated 8%

1. convert from lb to grams 8/2.2 = 3.64kg = 3640gms
2. 3640gm x 0.08 = 291mls deficit

2lb Cottontail Rabbit mildly dehydrated 5%

1. convert from lb to kg 2/2.2 = 0.9kg = 900gms
2. 900gms x 0.05 = 45ml deficit

ADD MAINTENANCE AND FLUID DEFICIT AMOUNTS FOR DAY 1

80gm American Robin severely dehydrated 10%

1. convert from gm to Kg 80gm= .080kg
2. .080kg x 50ml = 4mls per day maintenance

3. 80gms x .10= 8 ml deficit
4. Total fluids needed day 1 - 4ml + 8mls =12mls

8lb Virginia Opossum moderately dehydrated 8%

1. convert from lb to Kg 8/2.2 = 3.64kg body weight
2. 3.64kg x 50ml = 182mls per day maintenance
3. convert from lb to grams 8/2.2 = 3.64kg = 3640gms
4. 3640gm x .08 = 291mls deficit
5. Total fluids needed day 1 – 182ml+ 291ml =473mls

2lb Cottontail Rabbit mildly dehydrated 5%

1. convert from lb to kg 2/2.2 = 0.9kg
2. 0.9kg x 100ml = 91mls per day maintenance
3. convert from lb to kg 2/2.2 = 0.9kg = 900gms
4. 900gms x .05 = 45ml deficit
5. total fluids needed day 1 91ml + 45ml = 136mls

FLUID TIPS

- Sometimes you cannot give the total amount of needed fluids in one day, so you will give the remaining fluid deficit along with the maintenance amount the next day.

-Most of the time you will divide the amount needed into 2+ administrations depending on the stress level of the patient.

-Each day reevaluate the level of hydration.

-Until the animal is hydrated, eating and drinking normally, you will give maintenance fluids daily or as needed. Remember to add in approximate fluids delivered in food items if the patient is eating

-patient MUST be warm prior to hydrating, otherwise they won't absorb the fluids

-warm fluids to 100-102 degrees prior to administration

ORAL FLUID TYPES

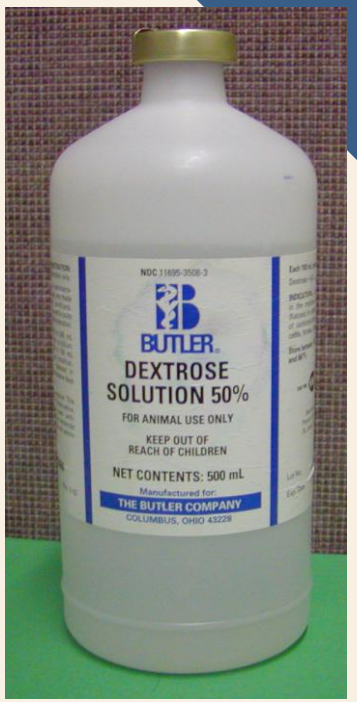
-Electrolytes (Na, K, Cl) and a glucose source

-Osmolarity like blood so it can be absorbed quickly

-If using Emeraid, Ensure or other whole food product it must be diluted substantially initially

DO NOT GIVE FULL STRENGTH EMERAID UNTIL THE PATIENT IS FULLY HYDRATED

-**used with mild dehydration in avian species or when hand feeding juvenile mammals**



-Do not use if: GI tract stasis, lateral recumbency, seizure/head trauma, severe stress, or shock. Patient must be able to protect their airway!

ORAL FLUIDS

MAMMALS

usually given by syringe

never force, allow patient to drink at its own pace, offer frequently

BIRDS

-usually given by gavage

-approximate crop volume = 25mls/kg

-extend the neck

-identify glottis, passing tube past it on the right side of the oral cavity

-feel or visualize the tube passing down the esophagus along your finger over the neck

-palpate the tube in the crop

-watch the mouth during gavage and if you see fluid or food in the oral cavity stop administration immediately and put the animal down

-curved metal gavage tubes are easier to palpate, gently turn the tube a bit in the crop to feel the round end

-to prevent aspiration, gavaging is the LAST thing you will do for this patient!

SUBCUTANEOUS (SQ) FLUID TYPES

- Normosol or Plasmalyte solution
  - Balanced electrolytes
  - Choice fluid for SQ route

- Lactated Ringers Solution (LRS).
  - Mild alkalinizing agent.
  - Contraindicated if patient: vomiting, liver disea

- 0.9% Sodium Chloride (NaCl).
  - Alternative subcutaneous fluid.
  - Normal or isotonic saline.

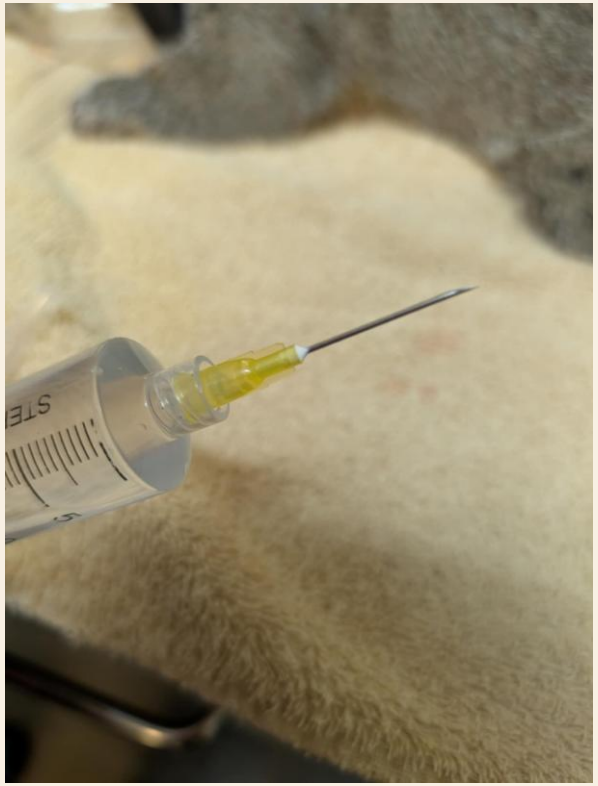
SUBCUTANEOUS FLUIDS

- Patient must be warm before administration. Heat support is always first!
- Can be used in birds, mammals and reptiles of all ages
- Warm fluids after drawing up into syringe in a hot water bath, should be approx. 100-102 degrees, test on your skin to check temperature.
- Can warm the entire fluid bag in a crock pot filled with water also
- Maintain sterility of your IV bag, if not used daily store fluid bag in the refrigerator. Wipe injection port of bag/bottle with alcohol before inserting needle. Date the bag when first punctured.
- If using an IV set with the bag of fluids always change needle after administration.
- ALWAYS use a sterile syringe and needle to help prevent abscessation infection

SQ FLUIDS: USE A STERILE SYRINGE AND NEEDLE, OR A BUTTERFLY CATHETER

SQ FLUIDS: MAMMALS

Tent skin over the dorsal shoulder/back area and insert needle bevel up at a 45° angle as not to hit muscle tissue or adjacent skin, then move needle more horizontally once fluids have started to flow. Inject quickly until site is full and visibly taught. Avoid areas next to limbs to prevent SQ dissection. If necessary, divide large volumes into multiple sites to reduce stress and associated pain. Moderately dehydrated mammals can usually be fully rehydrated in 12-24 hours with subcutaneous fluids.



SQ FLUIDS MAMMALS

Use 18-21 ga needles

SQ FLUIDS BIRDS

Use 23-25 gauge needle in small species, larger (20-23) gauge for waterfowl/raptors.

Place fluids in loose skin folds found in inguinal area (where legs leave trunk) or on upper back between shoulder blades

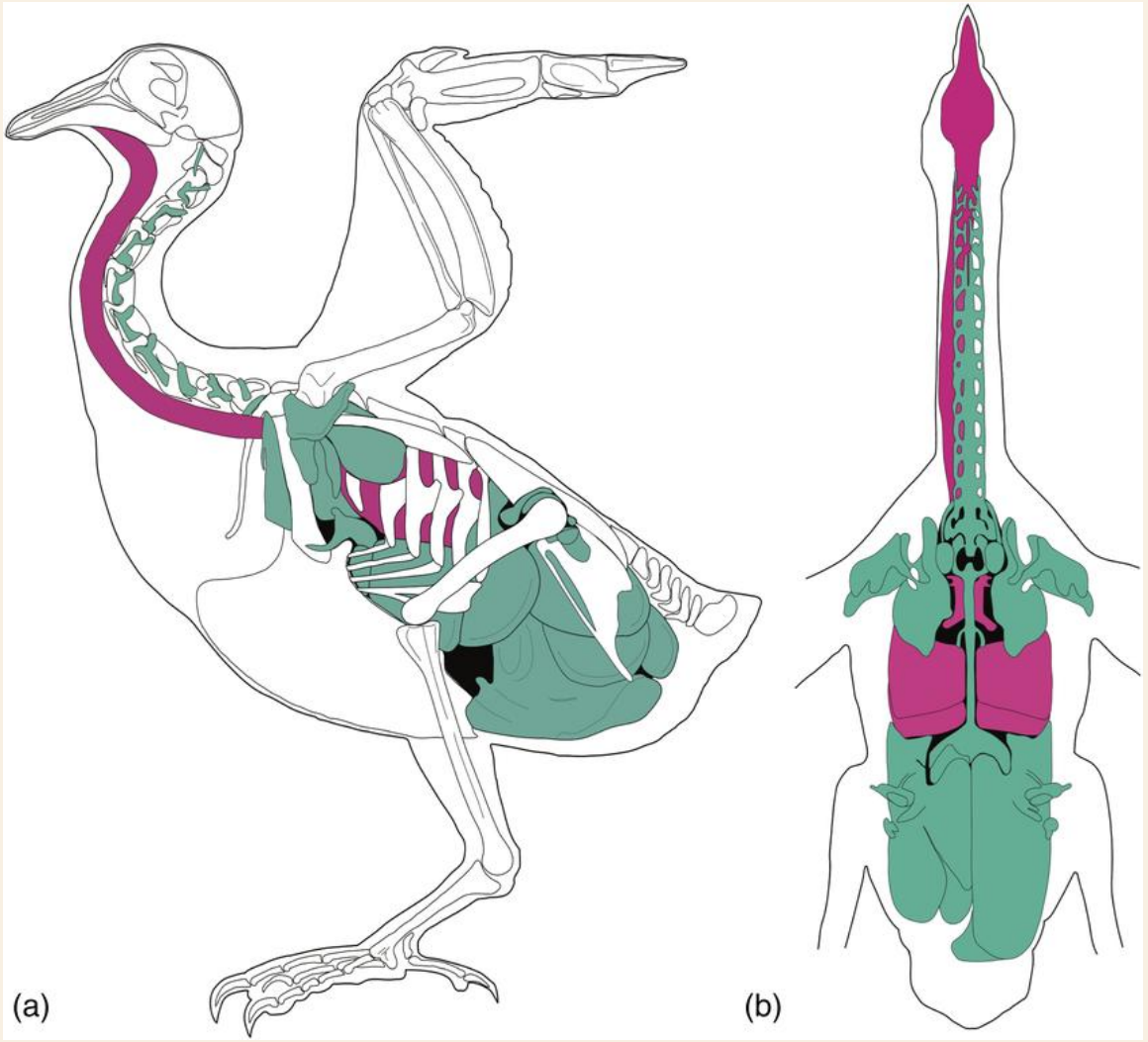
Insert needle horizontal to skin surface with bevel up, go shallow. Bird skin is thinner than paper!

Wetting feathers makes administration easier.

SQ FLUIDS BIRDS

CAUTION-AVOID AIR SACS INSIDE THE BODY.

Monitor respiration while giving SQ fluids!



BIRD SQ FLUIDS

- Avian skin has minimal elasticity and therefore, has less space available for fluid volumes.
- The daily fluid maintenance volume + 50% of dehydration deficit is easily absorbed in the first 24 hours.
- In the next 24 hours maintenance volume + the remaining 50% of dehydration deficit is given.
- Repeated evaluations are necessary to correct dehydration.
- Stress, volume of fluid to be administered and administration frequency are potential limiting factors.

REPTILE FLUIDS

SQ fluids given in inguinal fossa of turtles and
along the lateral flanks of lizards and snakes.
In snakes, can also give IC (in the body) by advancing needle
at a lateral edge of ventral scute at a 45 degree angle
in the center 1/3 of the body- aspirate first!

AMPHIBIAN FLUIDS

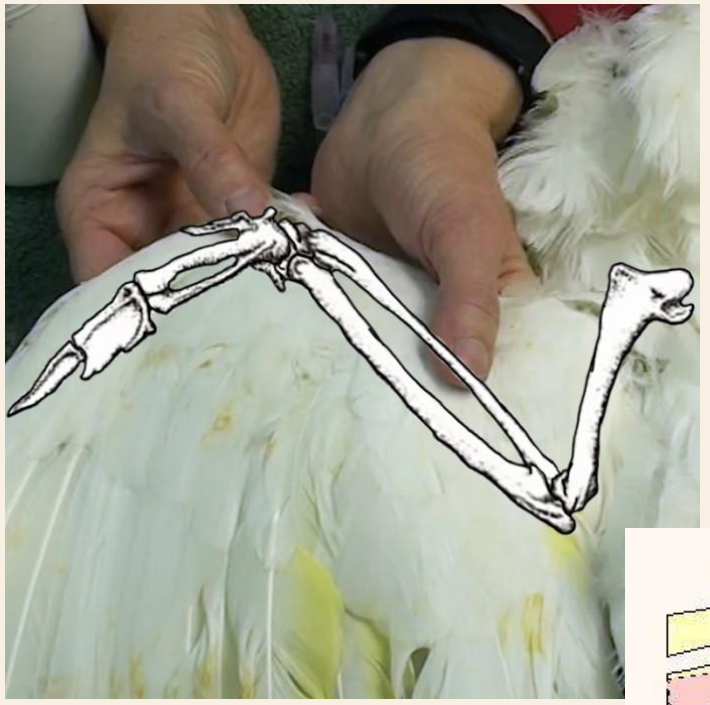
Amphibians are usually misted or soaked as they can absorb fluids from their skin

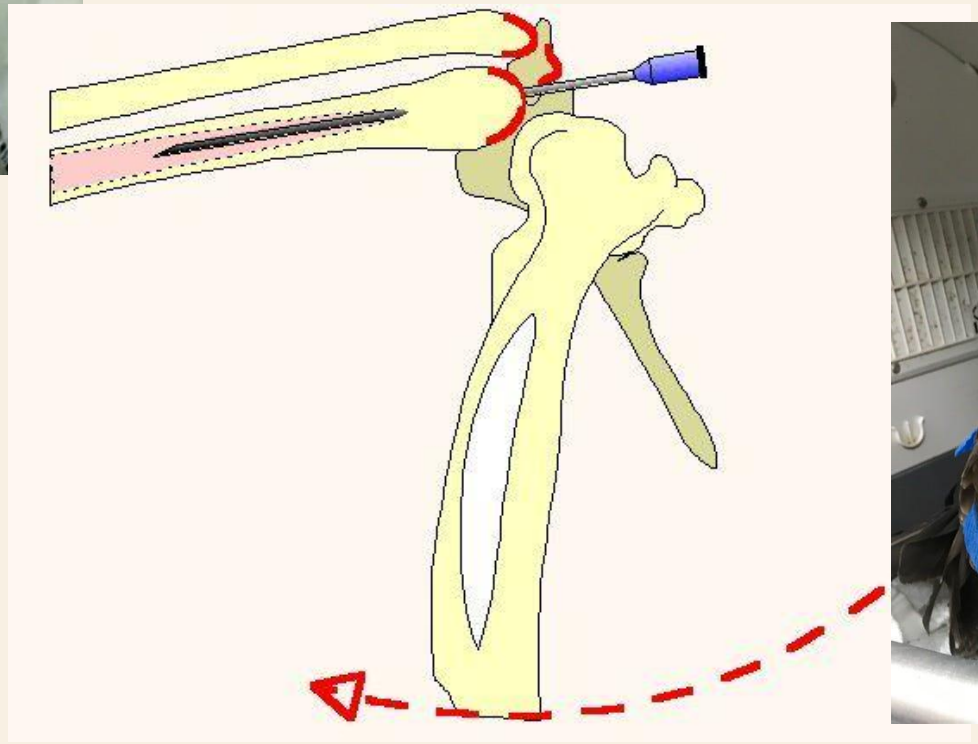
Use tepid, filtered water

INTRAOSSEOUS FLUIDS (IO)

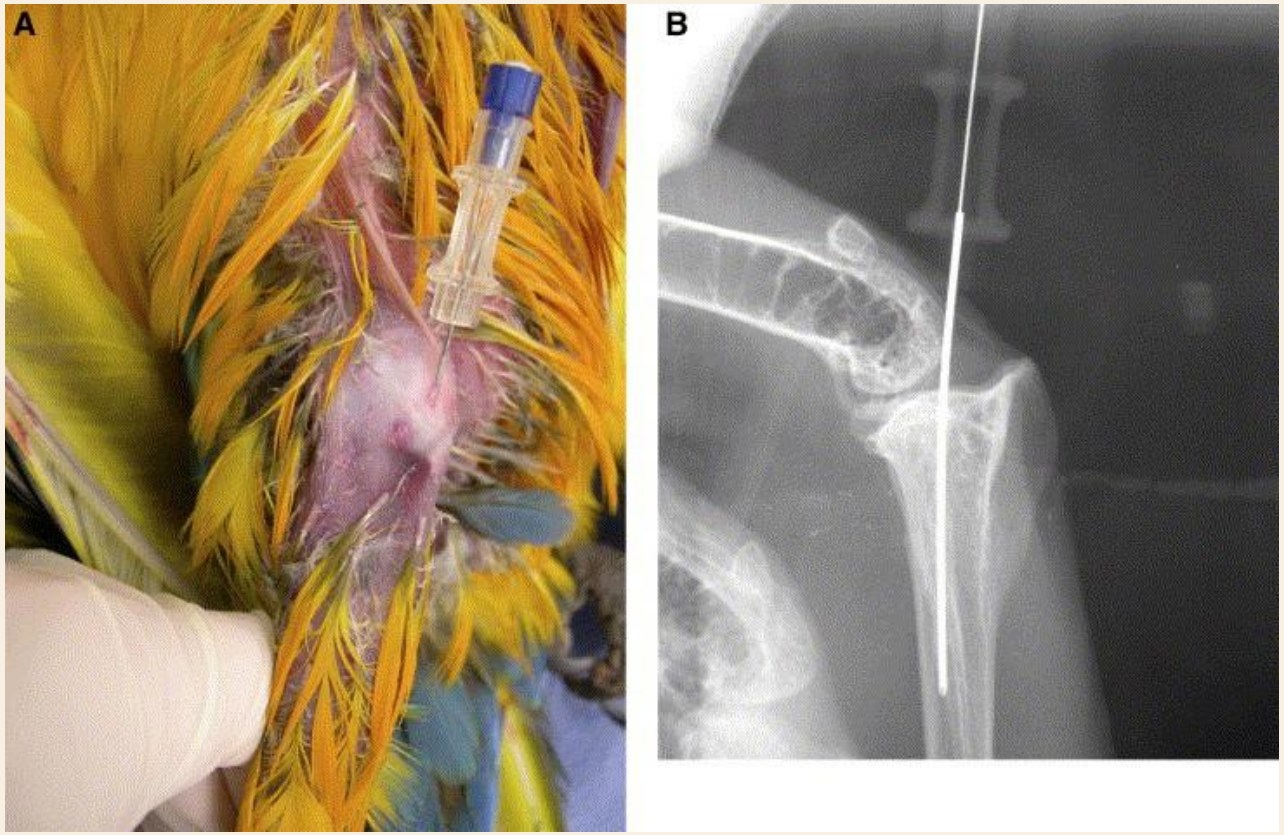
- Increased morbidity because it is transversing a joint, but for severe dehydration or intraoperative without IV access it is your best option. Use spinal needles which have a stylet if possible.
- Do not use femur or humerus in birds due to presence of air sacs in these bones
- Sterile prep of insertion site and sterile gloves needed to prevent infection, can use SQ lidocaine
- Long term fluid therapy possible with less risk than leaving an IV catheter in place
- Tape in place, can suture tape to the skin. Cover with vetwrap and place a few distraction tabs if needed.

IO FLUIDS BIRDS- ULNA



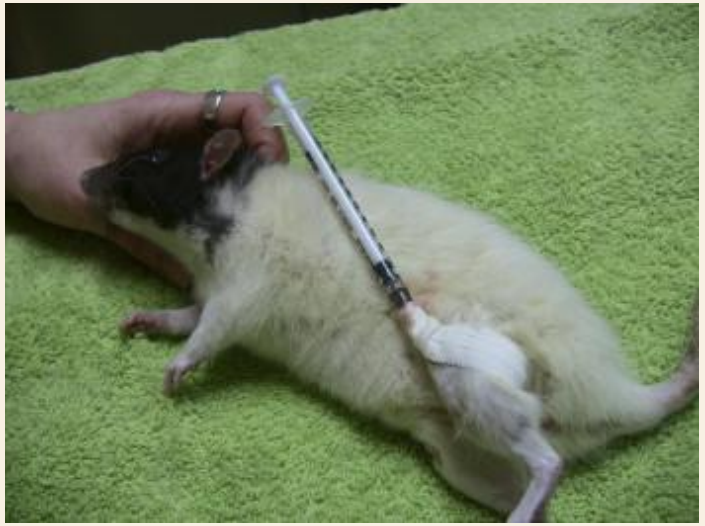


IO FLUIDS BIRDS- TIBIOTARSUS



-Needle inserted into the stifle joint on **either side** of the patellar ligament
-Cannot extend the stifle while catheter is in place, appear less comfortable than using the ulna in the awake bird

IO FLUIDS OTHER SPECIES



LAB PROCEDURES

- Weigh carcass, assume 5% dehydration for each
- Calculate daily maintenance, fluid deficit and total day 1 fluid needs
- Give SQ fluids to mammals
- Give SQ and gavage fluids to birds
- Give SQ or IC fluids to reptiles
- Place IO catheter in birds and mammals and tape in place

QUESTIONS????