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International Bird Rescue

Medical Problems of Oiled Birds

Waterbirds are
diverse and
weird



Species complicates everything: 'Non-pool birds' vs 'Pool birds' (in captivity)

Standing is ok

Dabbling ducks
Pelicans
Penguins
Gulls
Shorebirds
Boobies
Cormorants
Albatross
Terns
Coots, Moorhens,
Rails

Need to be in water 24/7 ASAP

Alcids
Loons
Grebes
Diving ducks
Other Procellariiformes
Some phalaropes



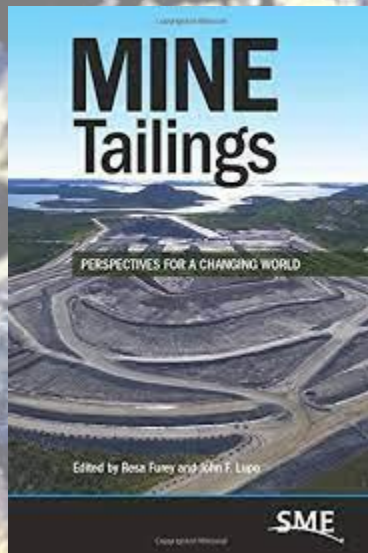
Documentation is very important: Especially during an oil spill

- Record keeping
 - Evidence collection if legal case possible
 - Photos
 - Product samples (feathers, fur, etc)
 - Medical records of injuries/issues
 - Feeding/hydration/medications given
 - Body weight trends
 - Blood values
 - Ongoing progress notes
 - Observations of attitude, appetite, behavior



Identity of contaminant = big deal

- Human hazard to handle animals?
- Causticity
- Ease of removal





Human Safety
= top concern

Amount of contaminant also important

...but not the way you'd expect

- Amount is not predictive of prognosis
- Heavily oiled animals often in better condition than lightly oiled animals (counter-intuitive)

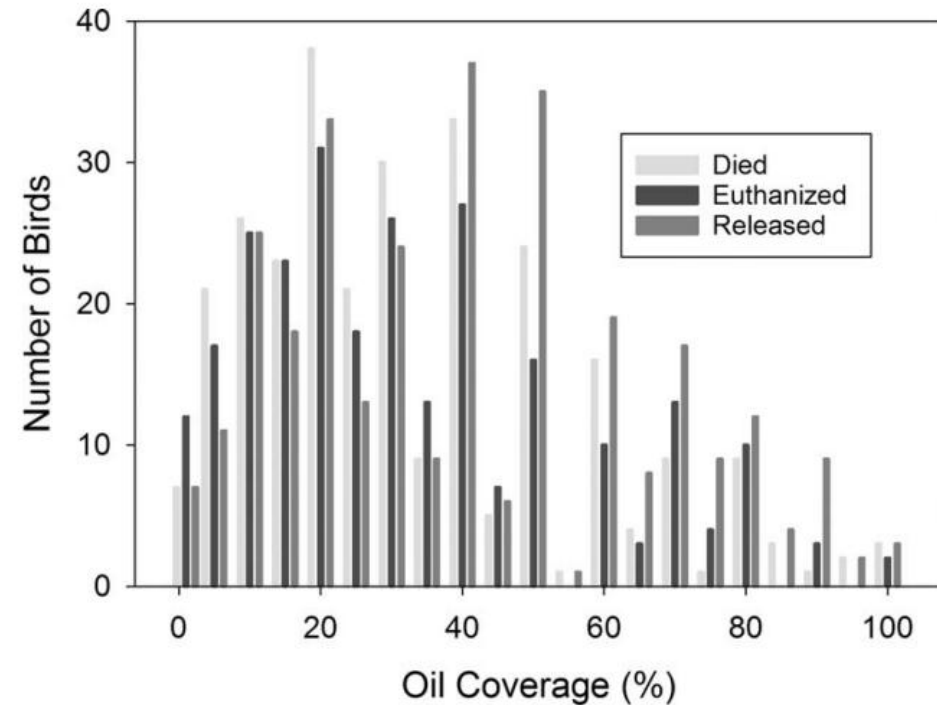


FIGURE 2. Numbers of Common Murrelets (*Uria aalge*) admitted for rehabilitation after oiling by the *S.S. Jacob Luckenbach* oil spill 2001–03, by final disposition and percentage of body covered in oil, grouped in 5% increments. Birds with higher oil burdens showed higher proportions surviving to release.





Immediate threats to staying alive:

- Blockage of orifices
 - Drowning
 - Choking on contaminant, aspiration
 - Unable to excrete



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Immediate threats to staying alive:

- Hypothermia
- Hyperthermia

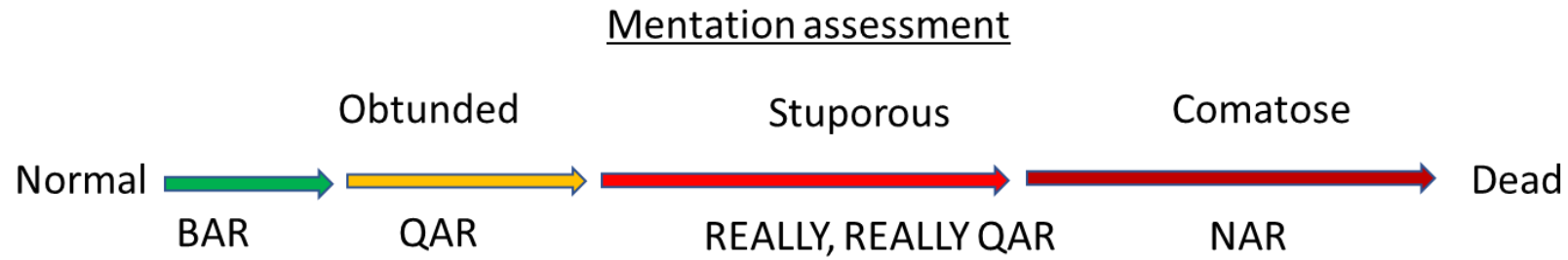
Immediate needs

- Clear mouth, nares, & vent of contaminant, flush eyes
 - Thermal support → normothermia
 - Rehydration → fluid therapy, droppings production+
 - Renourishment → begin feedings
 - ↑ ↑ ↑ IN THAT ORDER ↑ ↑ ↑
- Provide adequate temporary housing
- Quiet, stress reduction, minimal handling
- Address medical issues



Shock:

Clinical signs

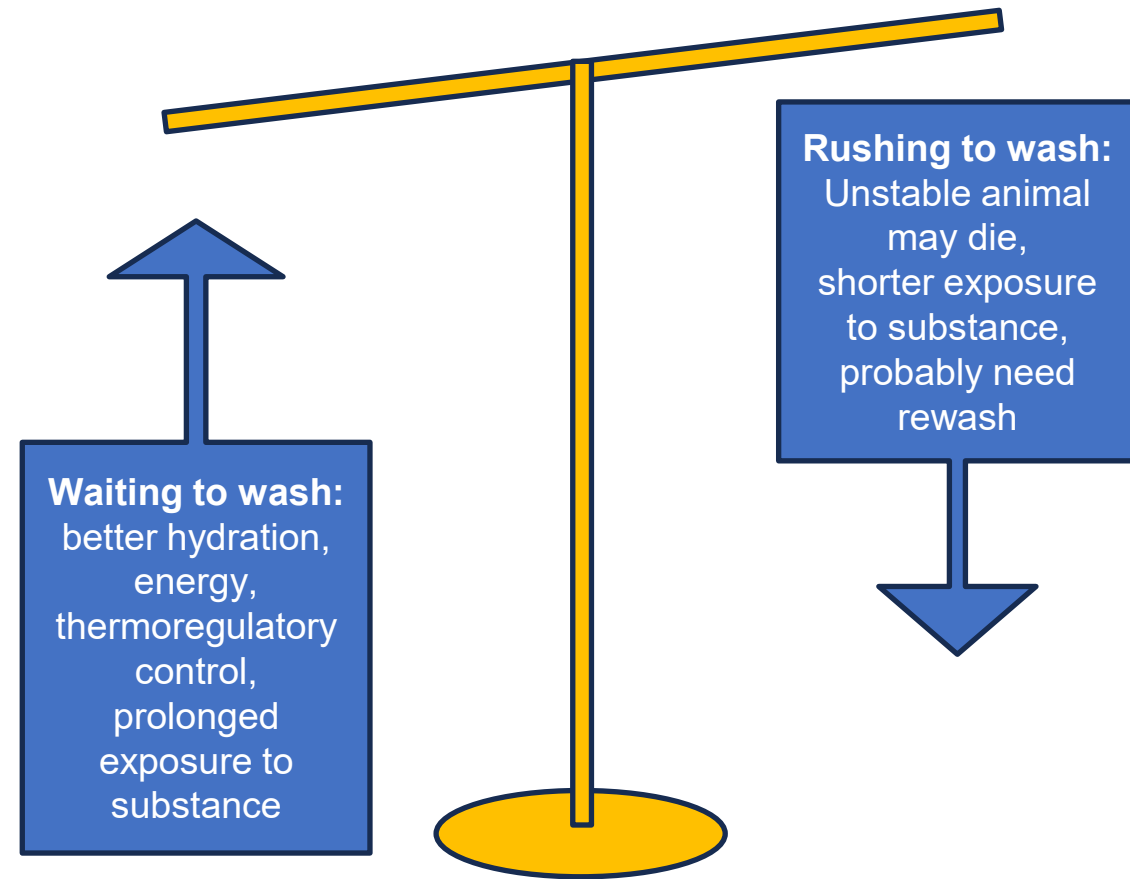


- Obtunded to stuporous mentation
- Rapid heart rate
- Weak pulses
- Pale mucous membranes
- Rapid breathing
- Glazed sunken eyes
- Lethargy
- Cold extremities
- Dry tongue
- Dilated pupils
- Decreased urine/droppings production

Stabilization corrects many of these initial issues

- Debilitated Individuals
 - Dehydration & starvation
 - Thermoregulatory issues
 - Stress, transport, handling, injuries
- Prepares them for wash and waterproofing in 2-3 days
 - Like preparing a sick person for a marathon

Stabilization is a fine art 😊



Housing Considerations

- Size of individual(s)
- # of individuals
- Substrate
- Perches/boxes
- Food Presentation
- Visual barriers
- Safety for caregivers
- If inadequate initially, correct ASAP



Housing Considerations

- Knotless netting bottom in soft-sided cage
- Pet dryers modified with an arm to direct warm air up from below
- Best option for pool birds when out of water



Stabilizing care

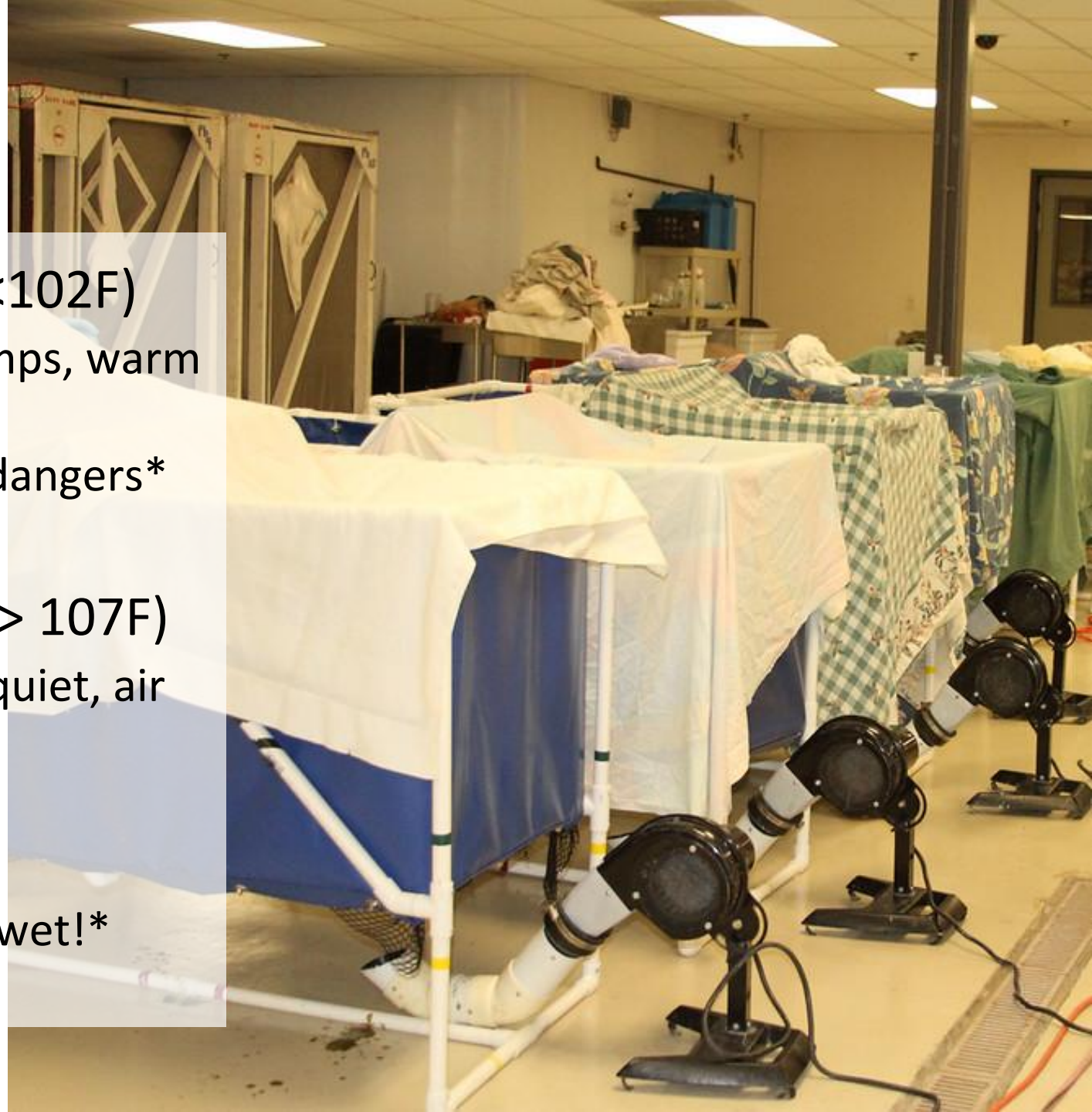


Classic tenets of wildlife rehabilitation

1. Thermal support
2. Fluid therapy
3. Nutritional support

Stabilizing care

- Hypothermia (cloacal temp <102F)
 - Incubator, heat pads, heat lamps, warm room (29.4C), space heaters
 - *Overheating, fire, and burn dangers*
 - Reflex hyperthermia
- Hyperthermia (cloacal temp > 107F)
 - Ambient room temperature, quiet, air circulation
 - Cool water, alcohol
 - STOP handling animal ASAP
 - *DO NOT get an oiled animal wet!*
 - Reflex hypothermia



Stabilizing care



Classic tenets of wildlife rehabilitation

1. Thermal support
2. Fluid therapy
3. Nutritional support

Stabilizing care

“Herd health” protocols needed if large numbers

- Individual treatment plans often not feasible
- Base plan on ‘typical’ patient
- Routes and amounts
 - Oral (PO): 30-50-70 ml/kg (raise amt as tolerated)
 - Intravenous (IV): 20 ml/kg bolus 1-2x/day
 - Subcutaneous (SQ): 50 ml/kg 1-2x/day
 - **Not recommended:** Intraosseous or indwelling catheters
- Fluid options:
 - Clean fresh water: PO only (last resort in low tech situation)
 - Isotonic crystalloids: PO, SQ, IV
 - +/- glucose/dextrose: PO, IV ok but spp may not need, SQ only if < 2.5%
- All: warm fluids to avian normal body temp

Do not use recipes formulated for humans
→ **NO SUCROSE** (table sugar)!

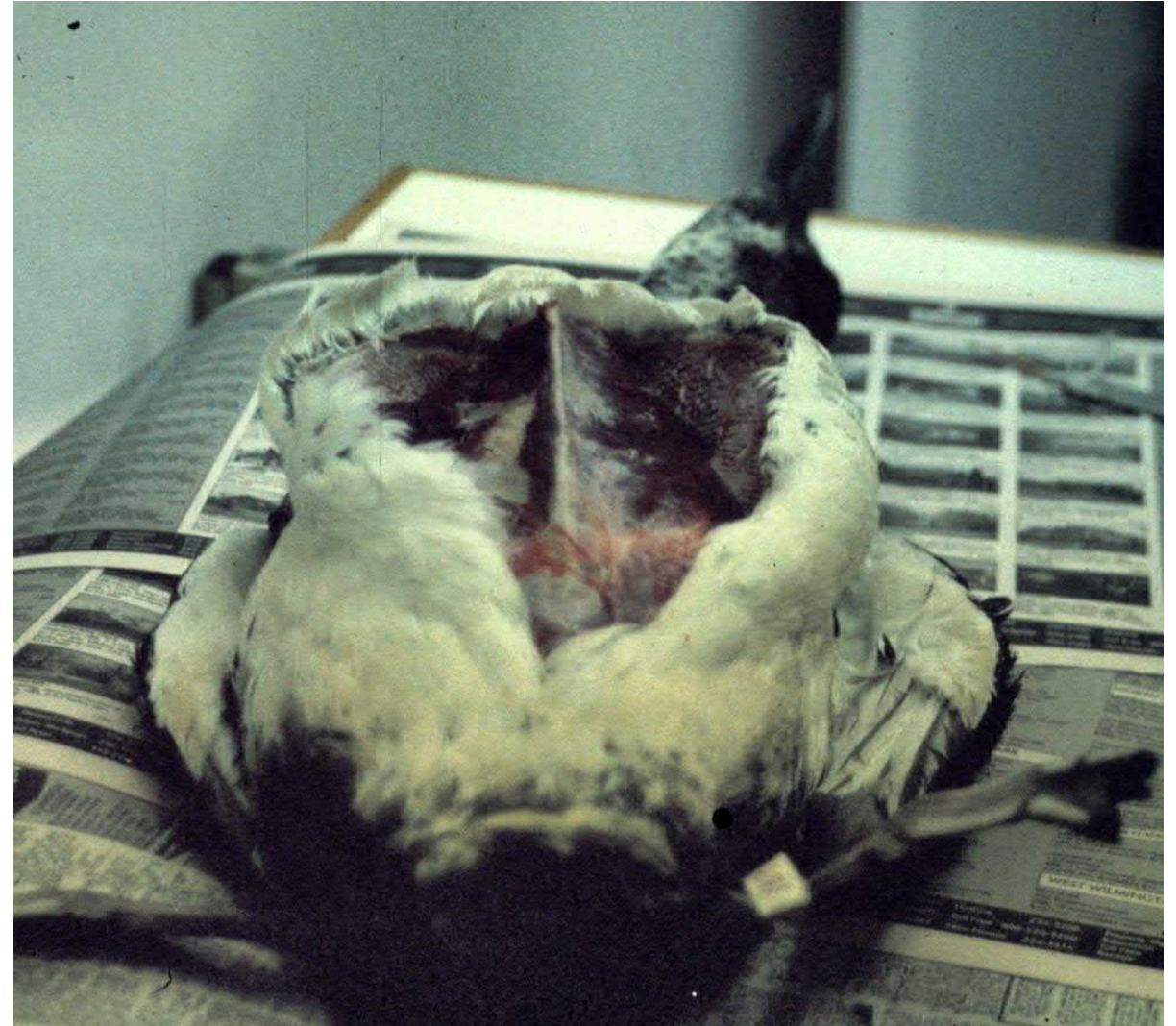
Stabilizing care



Classic tenets of wildlife rehabilitation

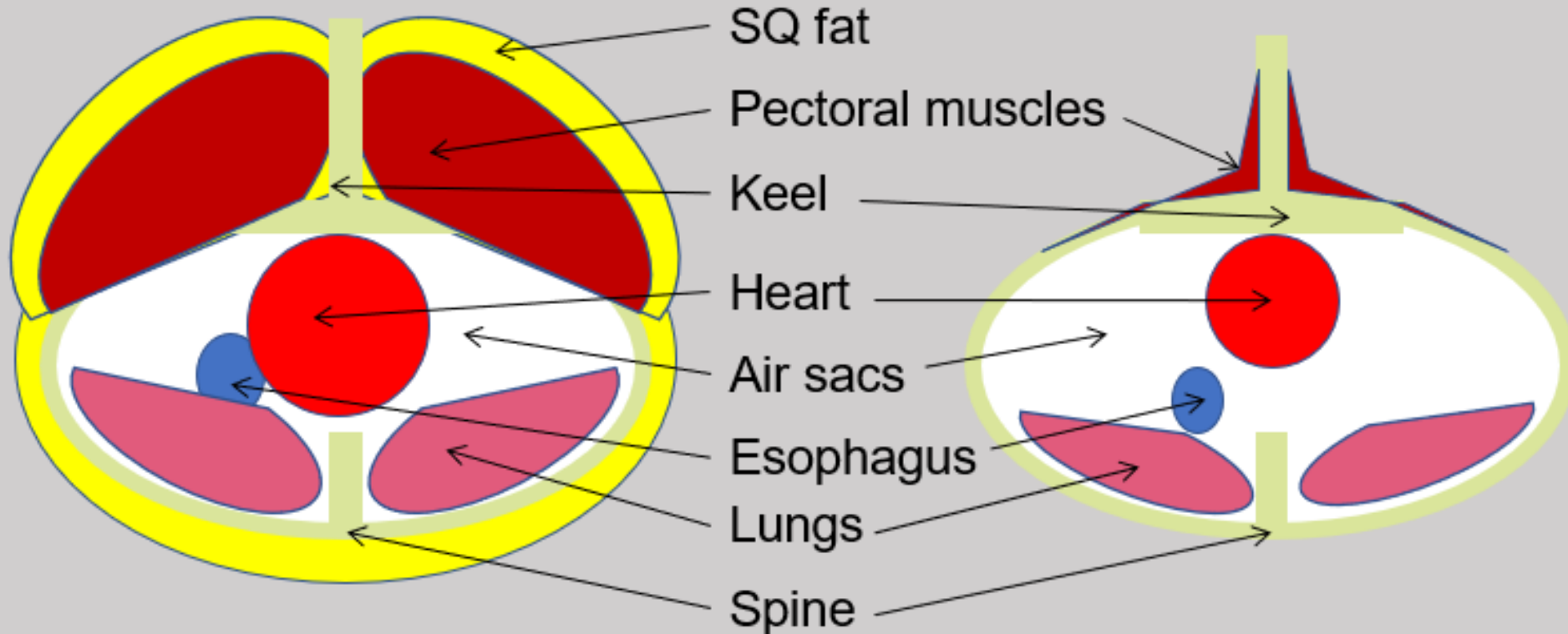
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2. Fluid therapy
3. Nutritional support

Nutritional depletion complicates recovery



Running out of gas

Body changes when emaciated:



Good condition seabird

Same bird, emaciated

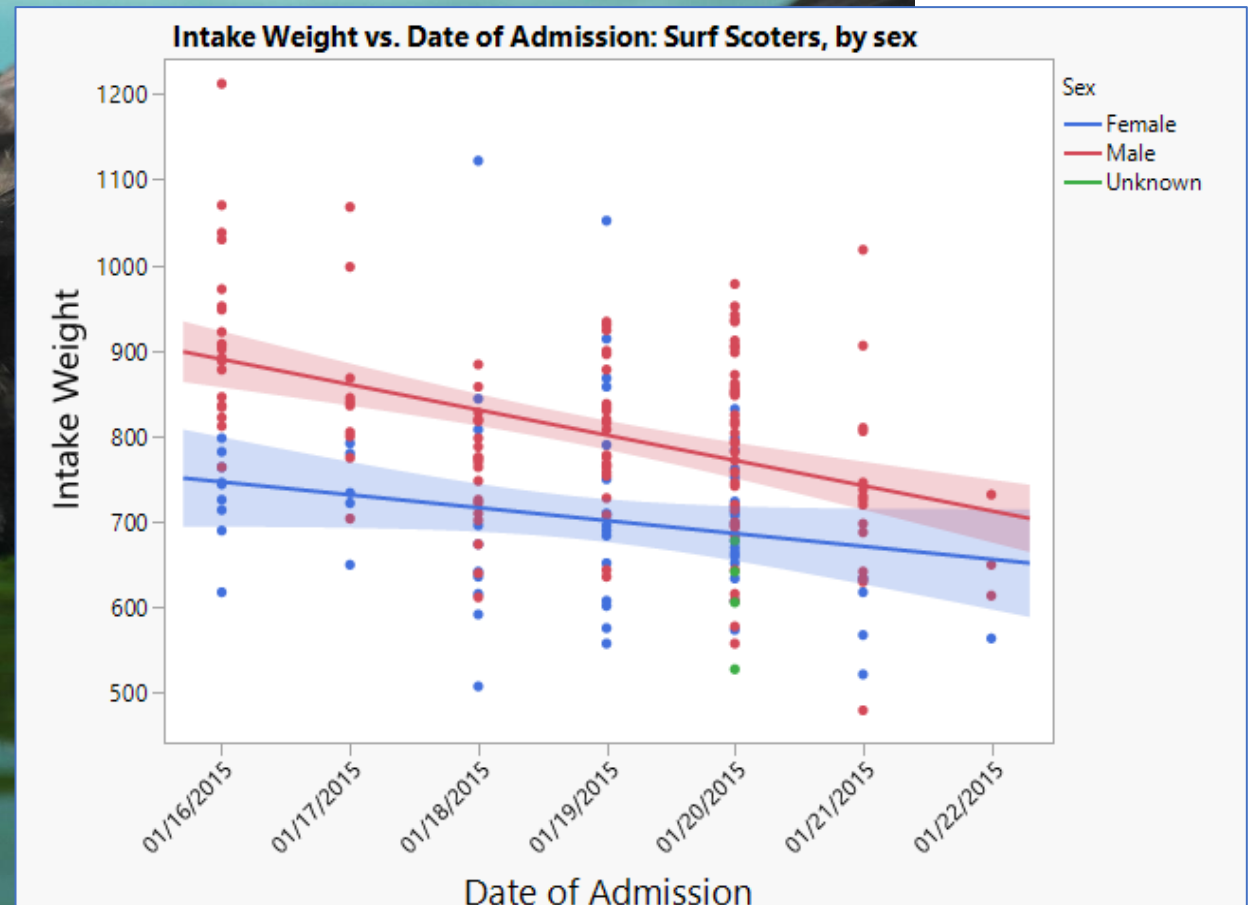
Cross section of body

Rapid weight loss once contaminated

250 Surf Scoters

- Jan, 2015
- San Francisco Bay
- Unknown, epoxy-like contaminant

Prompt
rescue is
paramount!!



Nutritional Tubings

- Species appropriate nutrition
 - Certain species will self feed quickly but many will not
- Gavage q 60-90 min x 12-14 hr/day until washed and self-feeding
 - Small volumes to start, raise as tolerated
 - Emerald piscivore, Emerald omnivore, etc.
 - Warmed slurries of normal diet
- Offer solid food when warm, alert, and well hydrated
- **No evidence of refeeding syndrome in birds**
- Continue nutritional support until after washed
- Avoid excessive PO glucose or other sugars in avian faunivores
 - Obligate gluconeogenesis
 - Can cause hyperglycemia or osmotic diarrhea



Emeraid® Piscivore
Critical care nutrition for debilitated sea birds



Emeraid Piscivore may be fed to a variety of aquatic birds including:

- Charadriiformes: Gulls, terns, alcids
- Ciconiiformes: Egrets, herons
- Gaviiformes: Loons
- Pelecaniformes: Pelicans, cormorants
- Podicipediformes: Grebes
- Procellariiformes: Fulmars, shearwaters

FOR VETERINARY & REHABILITATION USE ONLY Net Wt. 2 kg



Chronicle / Paul Chinn

© Chris Gomersall / naturepi.com

Ongoing Evaluations



- Weigh and physical exam daily or every other day
- Monitor feces
 - Output, diarrhea, blood, parasites, GI issues
- Regular blood sampling – PCV/TS at least
- Eval for wash every other day
 - Set criteria (PCV > 30%, TS > 2.5 g/dl, etc.)
 - Timing/feasibility
 - Logistical issues
 - Sedation is helpful during wash (2 mg/kg butorphanol + 1 mg/kg midazolam, reversal with flumazenil)
 - Wash is a whole additional task, not to be taken lightly!

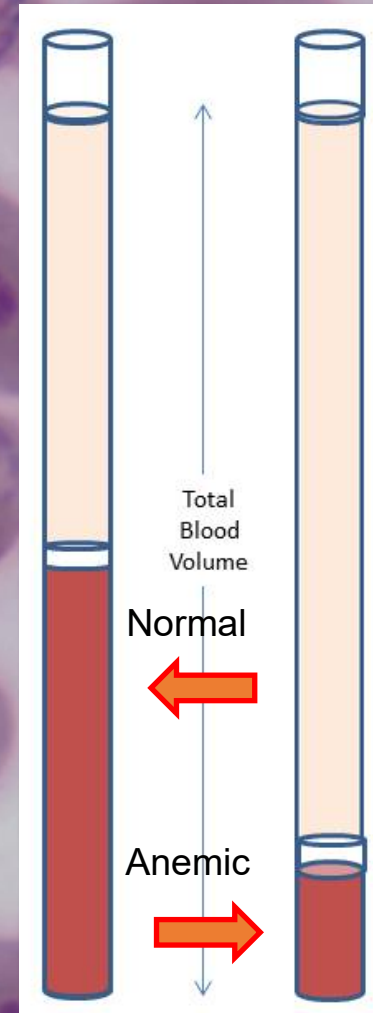
Other common problems beyond oil



Anemia

Causes:

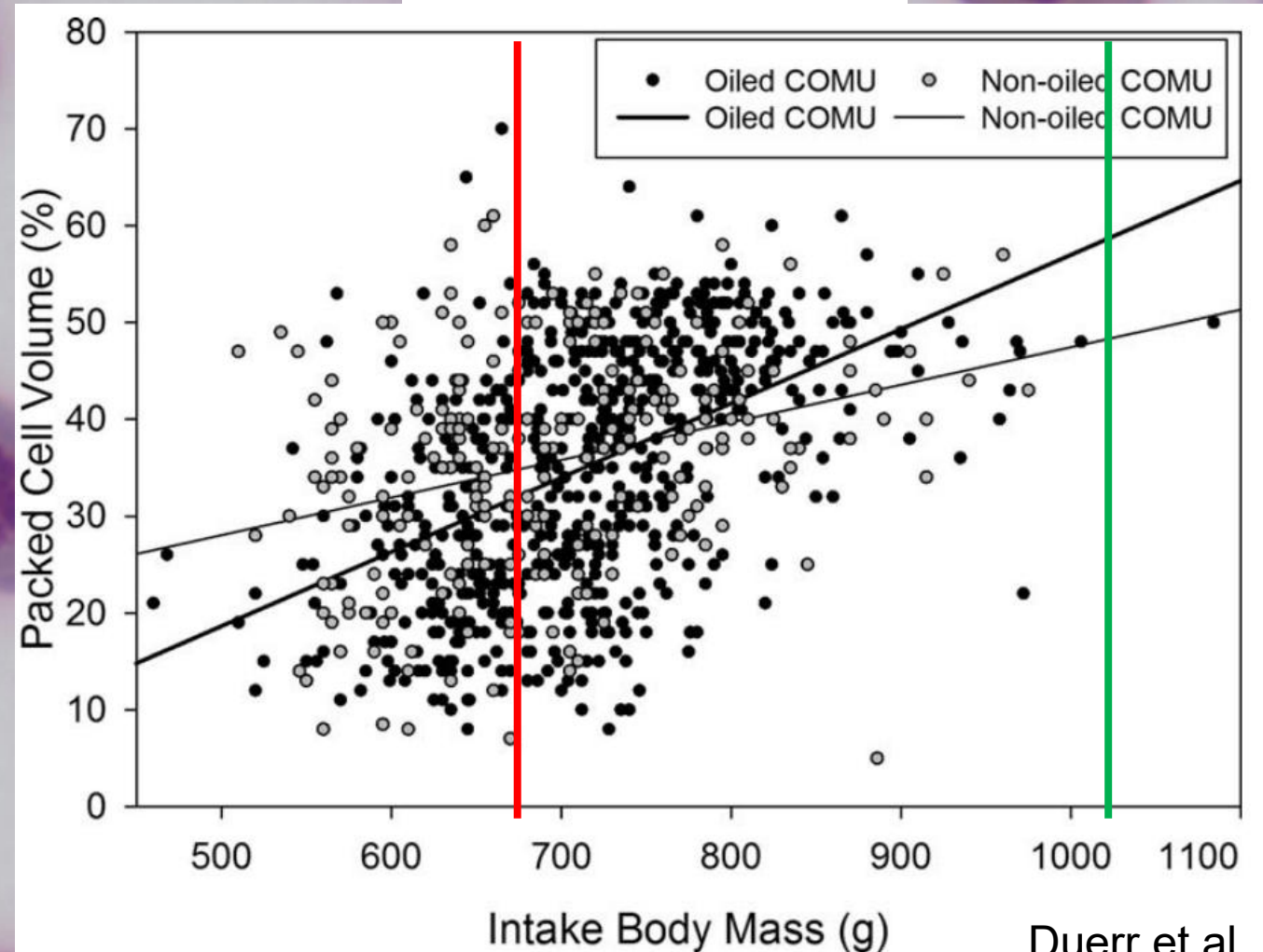
- Secondary to starvation/emaciation
- Hemolytic
- Blood loss
- Chronic inflammation
- Pre-existing health problems



Anemia

- Generally resolves with treatment of underlying problem
 - No transfusions needed
 - No iron injections needed
- Catabolic → anabolic condition
 - PCV is correlated to body mass in some species
- Some may need treatment for parasitism

Common Murres



Anemia

Individual Oiled
Wildlife

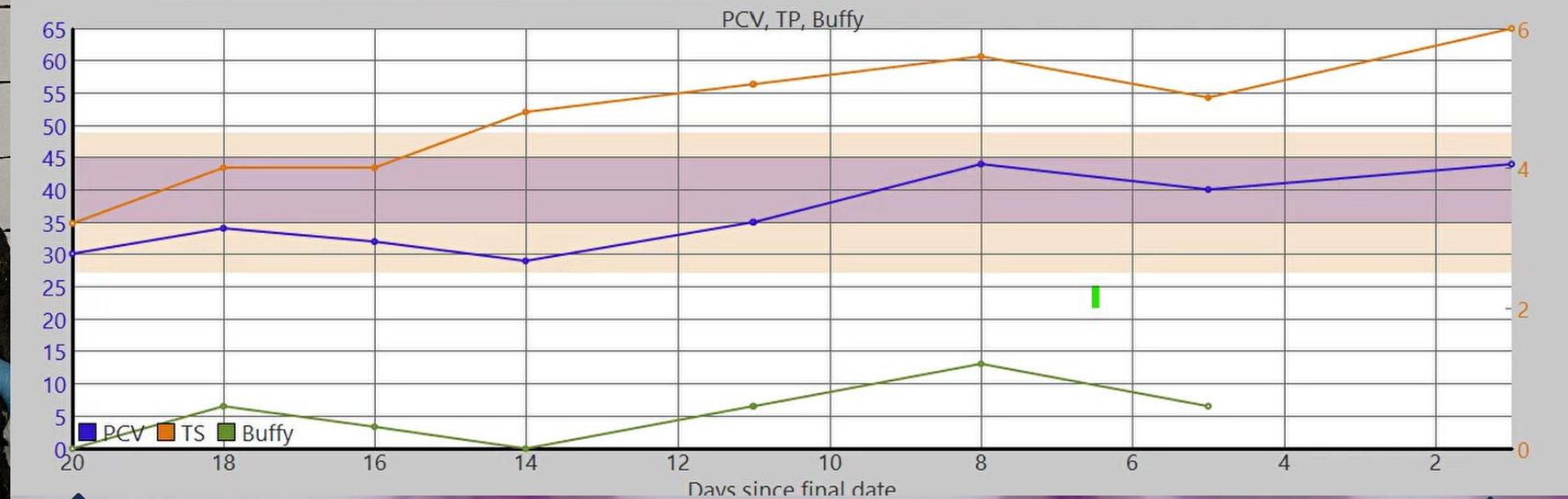
Species: COMU
Intake Date: 2/9/24
Intake Time: 1800
Temp Band: 24-99
WRMD #: 24-17



Evidence photo

SF-2024-0099

Lead	Group weight ranges			Enrichment		Behavior		Fecals		
at	Imagery	PT	Eyes	Flight	Feathers	Wound records	Wound reports	PCV/TS/Buffy	CBC	Blood chemistry



Intake
PCV=30%

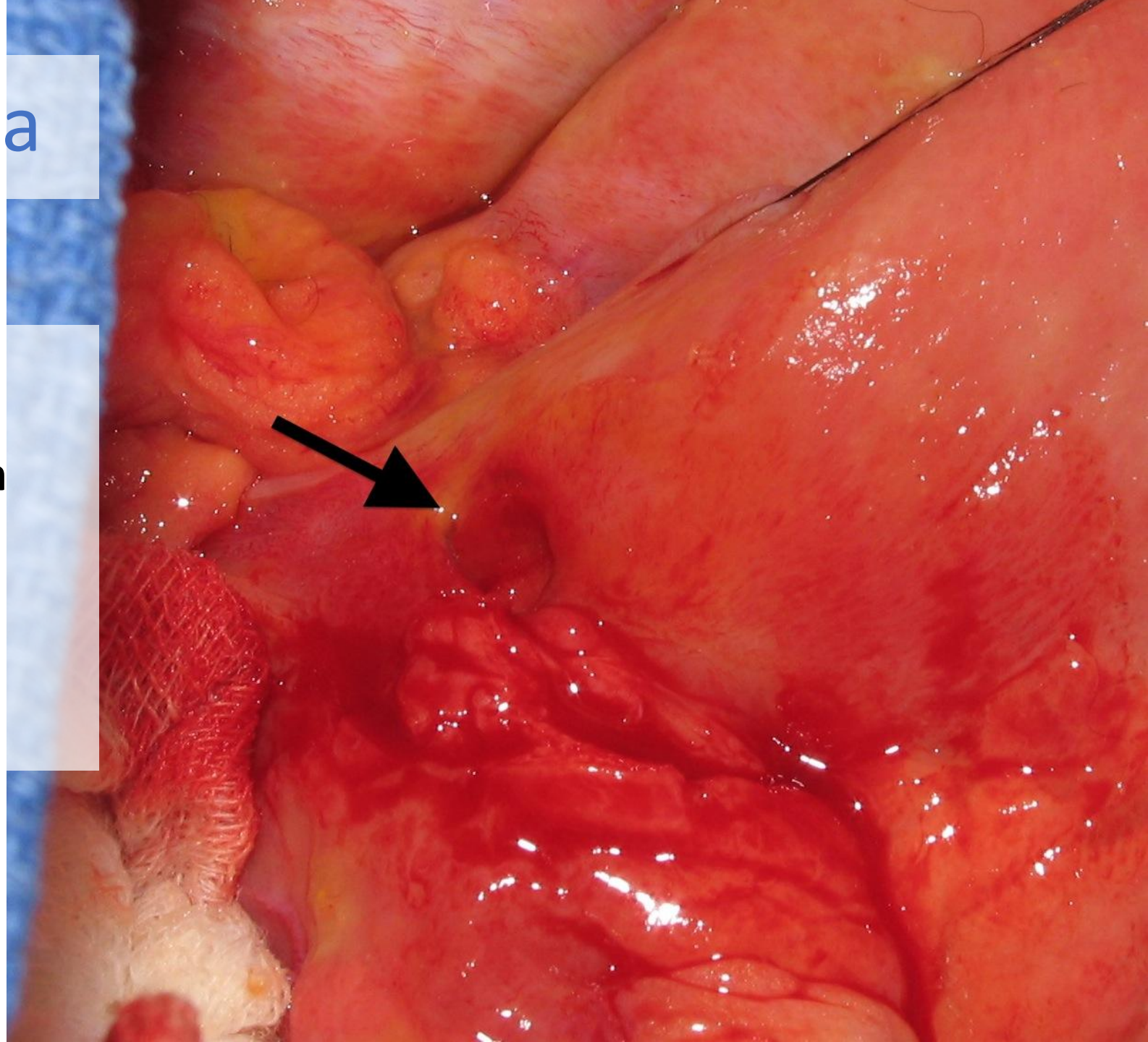
Typical recovery over 10-20 days

Release
PCV=42%

Hypoproteinemia

Causes:

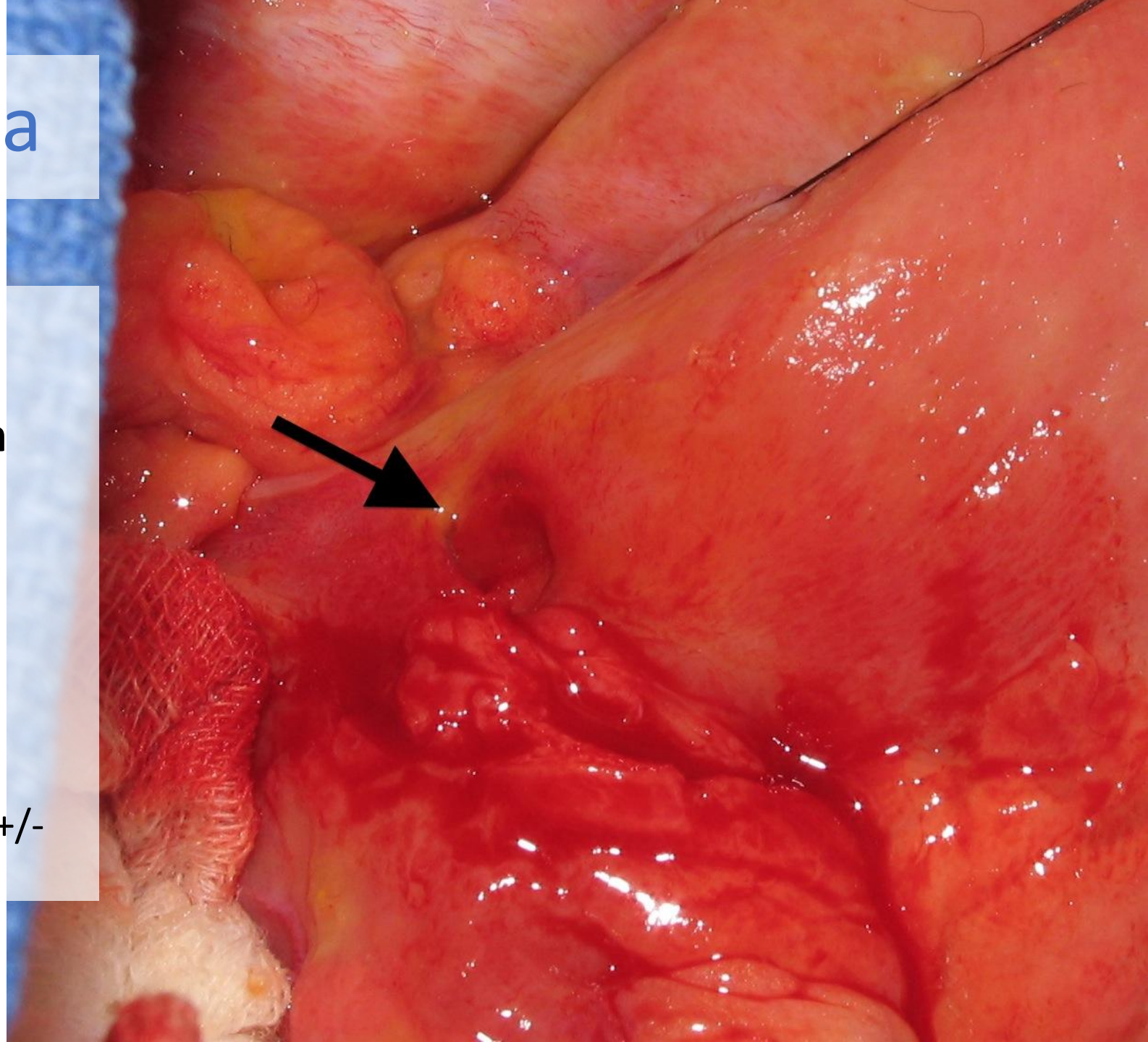
- Secondary to emaciation/**starvation**
- Protein-losing enteropathy (**GI ulceration**)
- Protein-losing dermatopathy (**burns**)



Hypoproteinemia

Treatment:

- Secondary to emaciation/**starvation**
 - → Feeding program
- Protein-losing enteropathy (**GI ulceration**)
 - → GI protectant meds
- Protein-losing dermatopathy (**burns**)
 - → Topical treatments +/- systemic meds



Toxic effects

- Cardiovascular
- Immunologic
- Reproductive
- Kidney/liver damage



<http://www.thepoultrysite.com/publications/6/diseases-of-poultry/228/round-heart-in-turkeys-dilated-cardiomyopathy/>

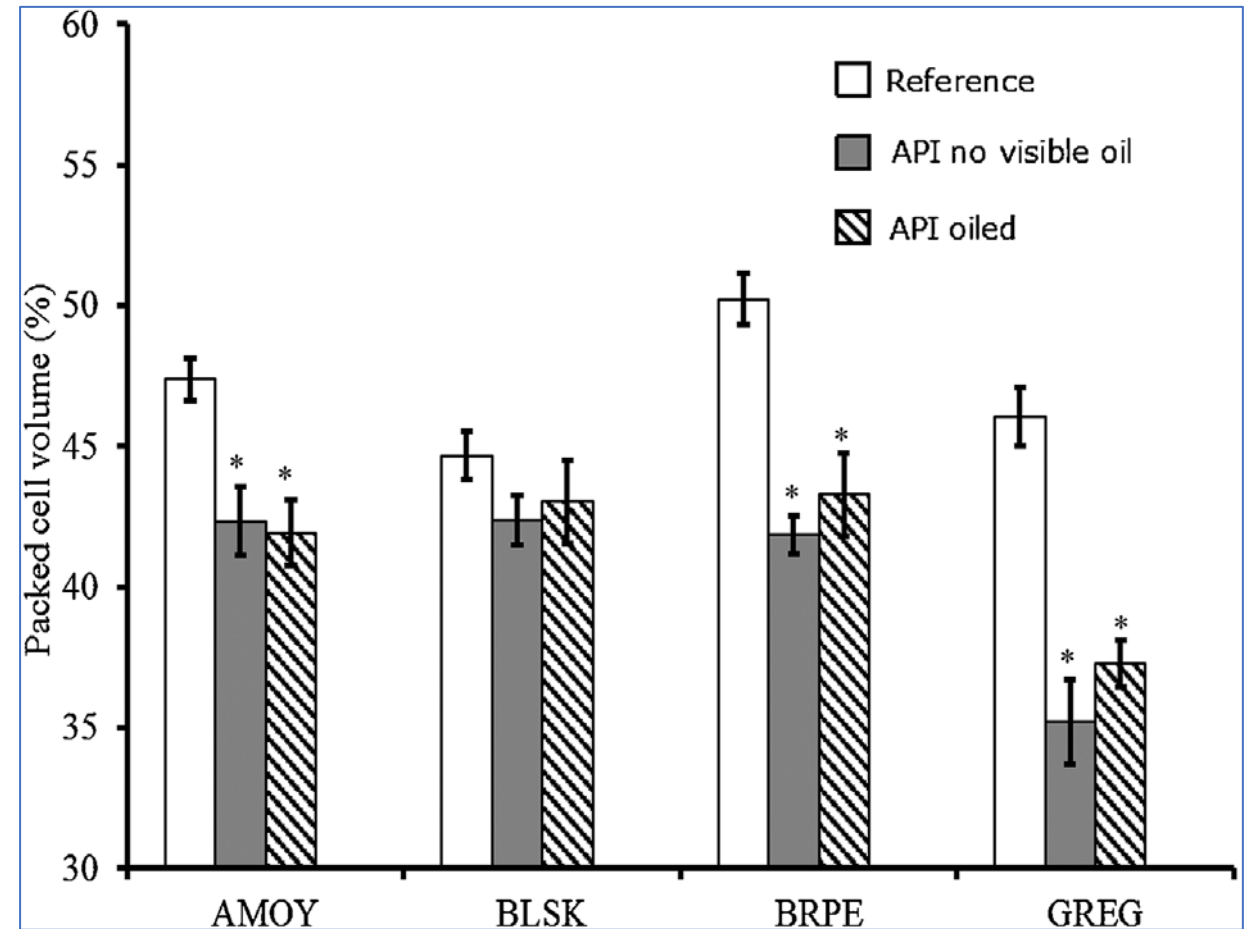


FIGURE 4: Percentage packed cell volume (mean standard error) found in American oystercatcher (n=50), black skimmer (n=103), brown pelican (n=81), and great egret (n=89) from reference (nonshaded bars), areas of potential impact from the Deepwater Horizon oil spill with no visible oil (shaded bars), and areas of potential impact with visible oil (hatched bars). Significant difference ($p < 0.01$) from reference sites. AMOY=American oystercatcher; API=area of potential impact; BLSK=black skimmer; BRPE=brown pelican; GREG=great egret.

Fallon et al., 2017

Respiratory tract disease

Causes:

- **Direct damage**
 - Aspiration of product or water
 - Fume inhalation
- **Indirect damage**
 - Nutritional depletion + immune system dysfunction + exposure to pathogens during care
 - Aspergillosis
- **Species susceptibility varies**



Great Horned Owl
Trapped in tank at refinery
Died during wash
In care x 2 days before wash
No resp signs

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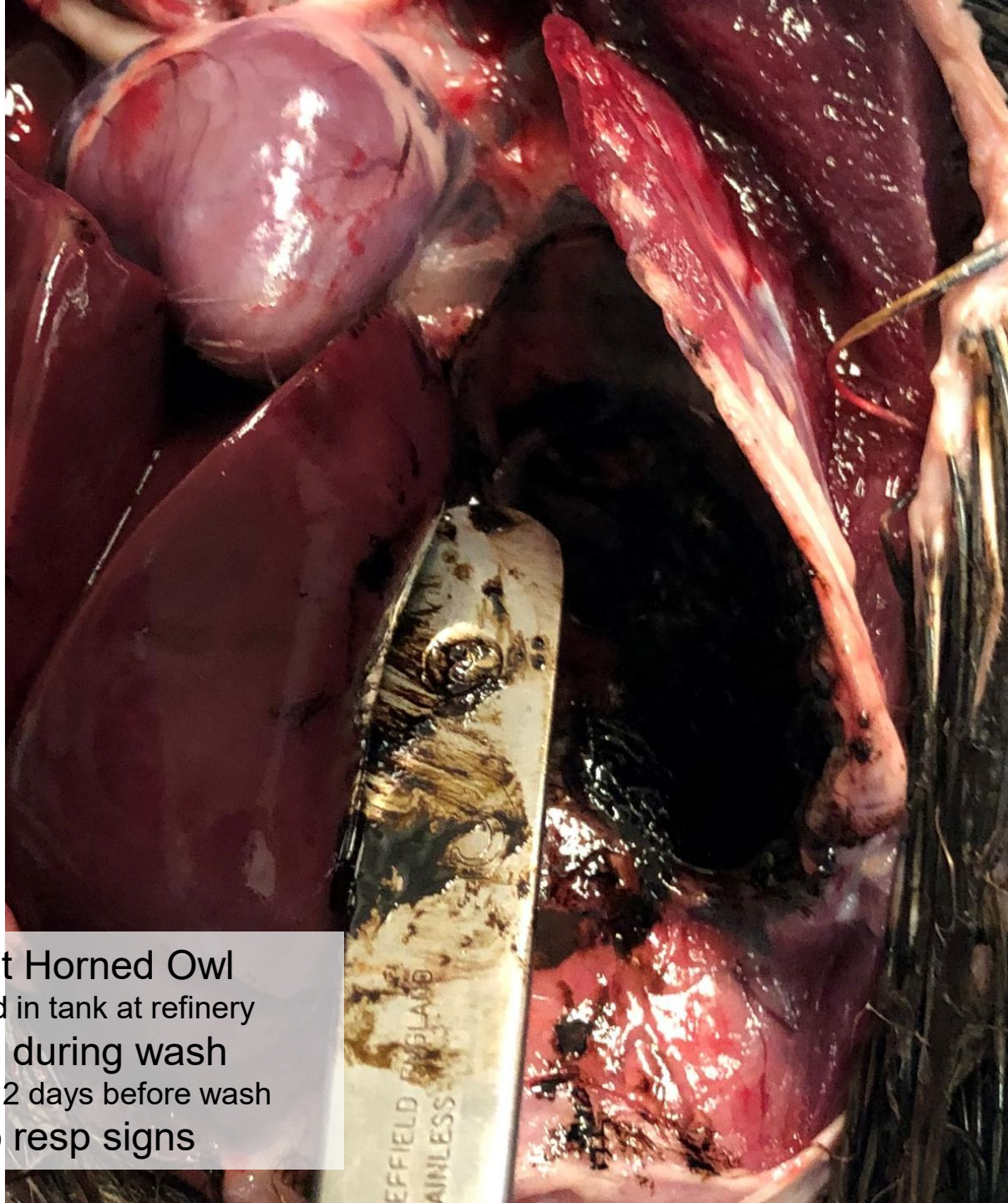


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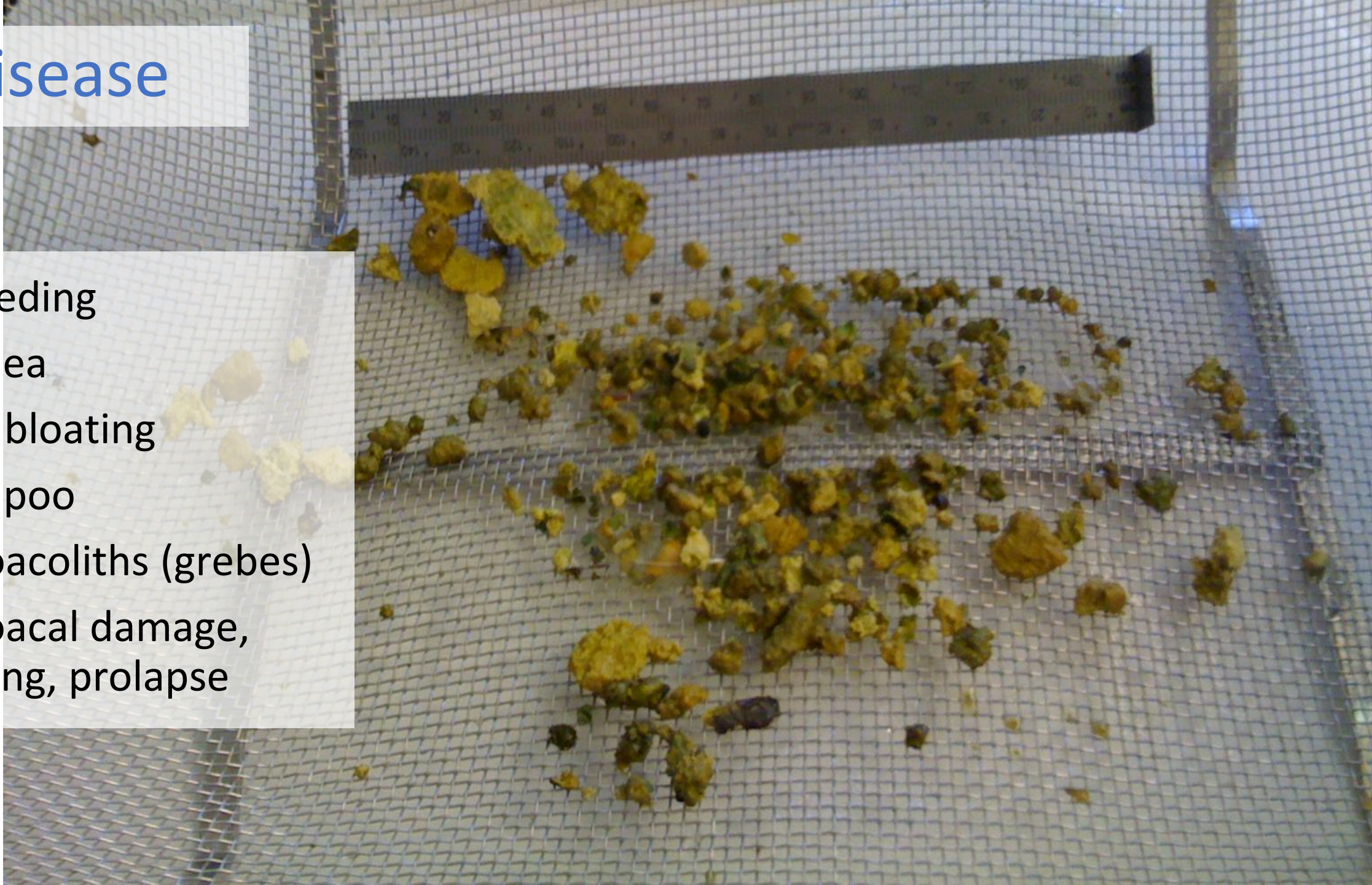
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GI disease

- GI bleeding
- Diarrhea
- Gassy bloating
- Gritty poo
- +/- cloacoliths (grebes)
- +/- cloacal damage, bleeding, prolapse



Damaged plumage

A close-up photograph showing a person's hands examining a bird's plumage. The bird's feathers are white and appear frayed, broken, and disheveled. The person's fingers are gently holding and inspecting the feathers. The background is a light blue surface.

Broken feather patches

- Direct damage
- Overall plumage condition?
- Excessive preening?

Damaged plumage



Broken feather patches

- Direct damage
- Overall plumage condition?
- Excessive preening?

Treatment

- Scattered plucking
- Euthanasia if large area

Damaged plumage

Nakedness (dropping feathers)

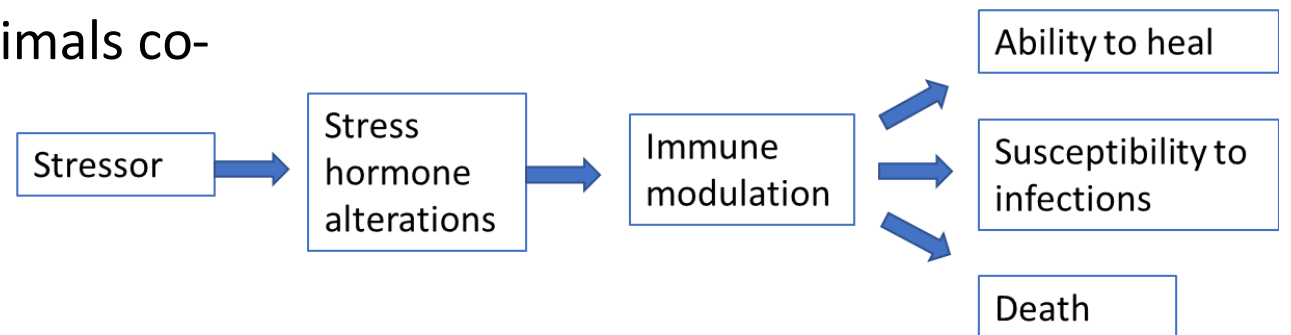
- Diesel spill
- CAGOs dropped contour feathers
- Skin in good condition, no burns
- Regrew in 4-6 weeks
- Similar during diesel spill in Sacramento, CA



Stress

Stressors:

- The contamination itself
- Pain of injuries
- Discomforts of starvation, dehydration
- Pre-existing health problems
- Captivity: unusual sights, sounds, smells, foods
- Captivity: Being handled/tubed
- Captivity: Inability to get away/helplessness/vulnerability
- Captivity: Conspecifics or other animals co-housed



Typical Injuries



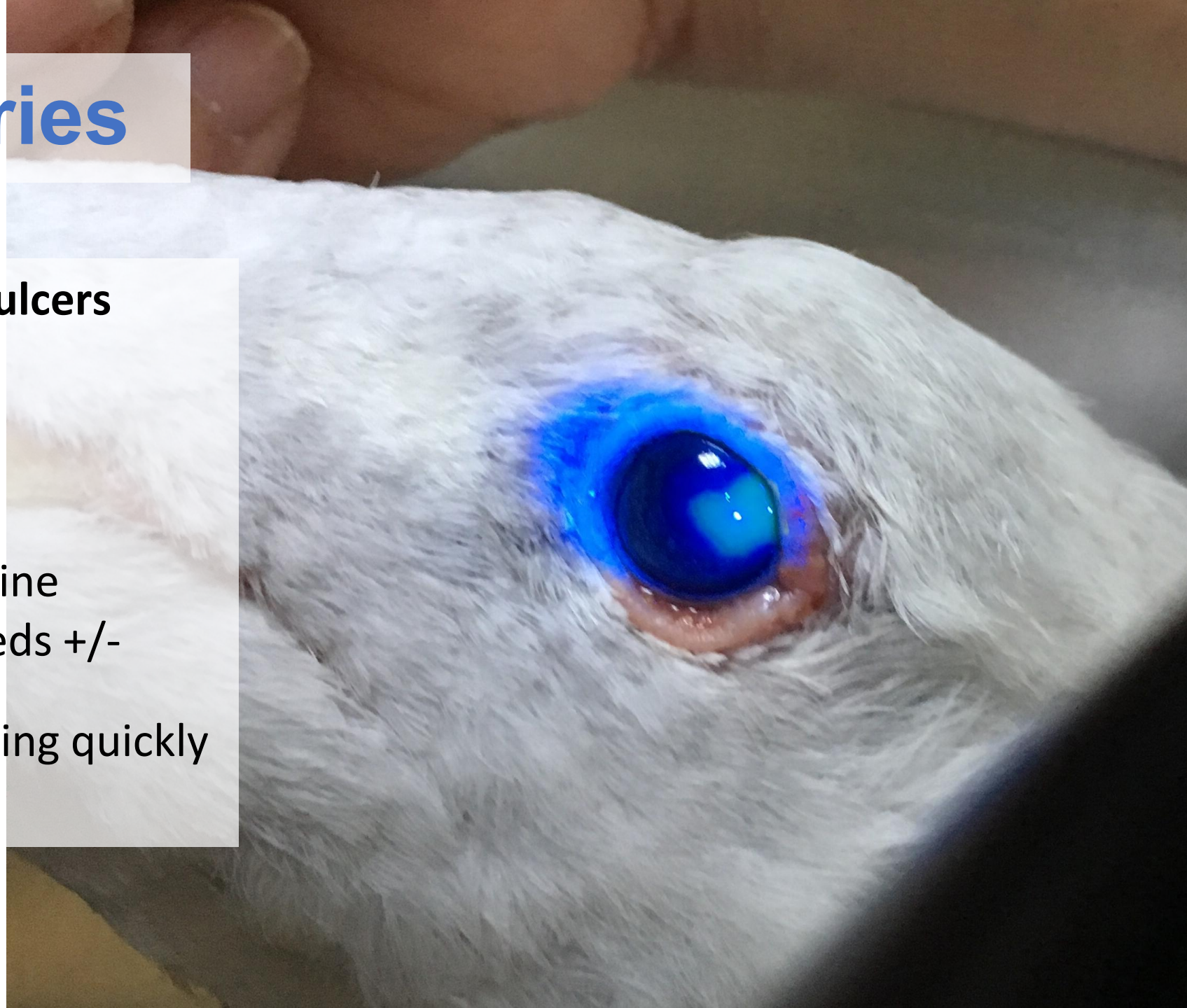
Typical Injuries

Eye irritation/corneal ulcers

- Nictitans damage
- Eye infection risk

Treatment:

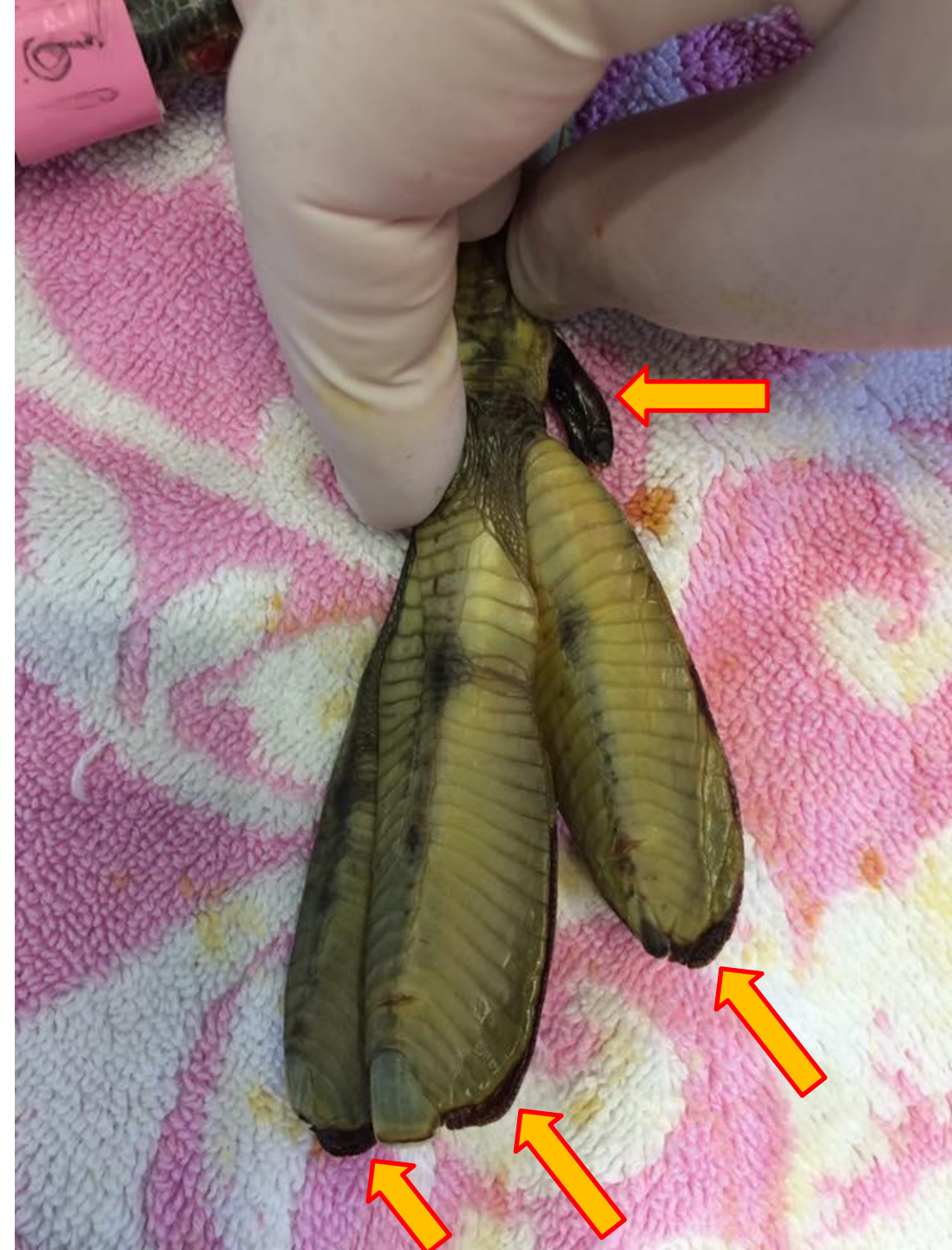
- Flush with sterile saline
- Begin topical eye meds +/- systemic meds
- Vet check if not healing quickly after wash



Typical Injuries

Ischemic injuries/tissue necrosis

- Poor blood perfusion
 - Hypothermia
 - Dehydration
 - Anemia
 - Emaciation
- Bony prominences of leg joints and keel
- Distal toe tips/webbing
- Mild to severe
- Treatment depends on what body part and extent/progression
 - Dead tissue is open door for bacteria and fungus



Typical Injuries

Burns

- Exposed scaly skin
 - Legs
 - Feet
- Feathered skin w/o contours
 - Thighs
 - Axilla
 - Ventral wings
- Depth of burn → severity
 - Superficial = sloughs off
 - Deep → damage to deeper tissues



Typical Injuries

Burns

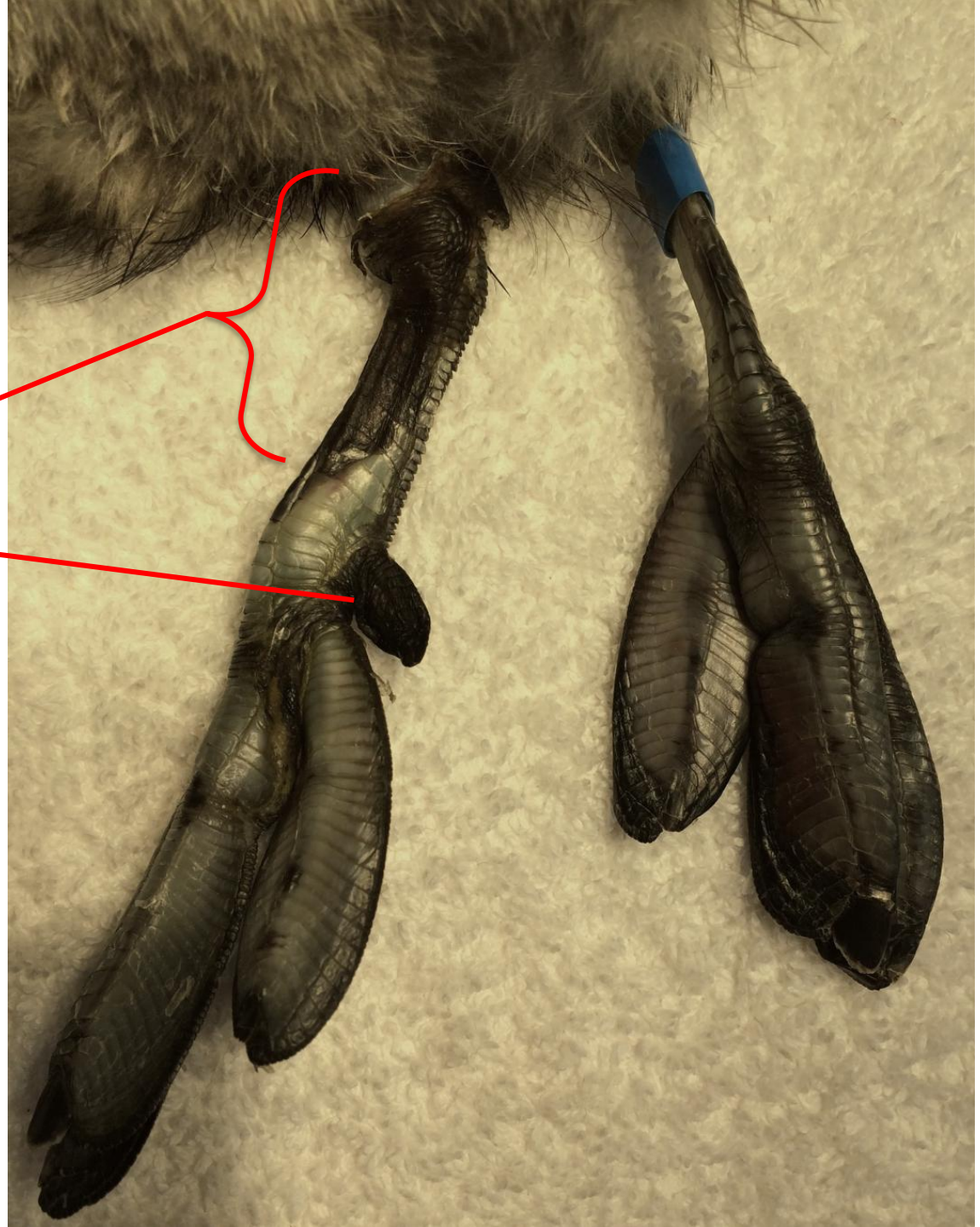
- Treatment
 - During stabilization
 - Wipe off product with gauze/methyl
 - Silver hydrogel
 - SSD cream, others
 - After wash
 - Feathered skin:
 - Time for healing
 - Surgical if full thickness
 - Scaly skin
 - Hydrocolloid dressings
 - Other products
 - +/- Surgical



Typical Injuries

Severe burns

- Deep burn to bone
- Loss of blood supply
- +/-Euthanasia depending on affected anatomy





2 weeks after admission
Pink areas--burns had already sloughed off



4 weeks after admission

Typical Injuries

Keel lesions

- Pressure/ischemia
- Burns
- Or both

Treatment

- Mild to moderate → none
- Moderate to severe → surgery or euth



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Typical Injuries

Wrists (carpi, aka “bumpers”)

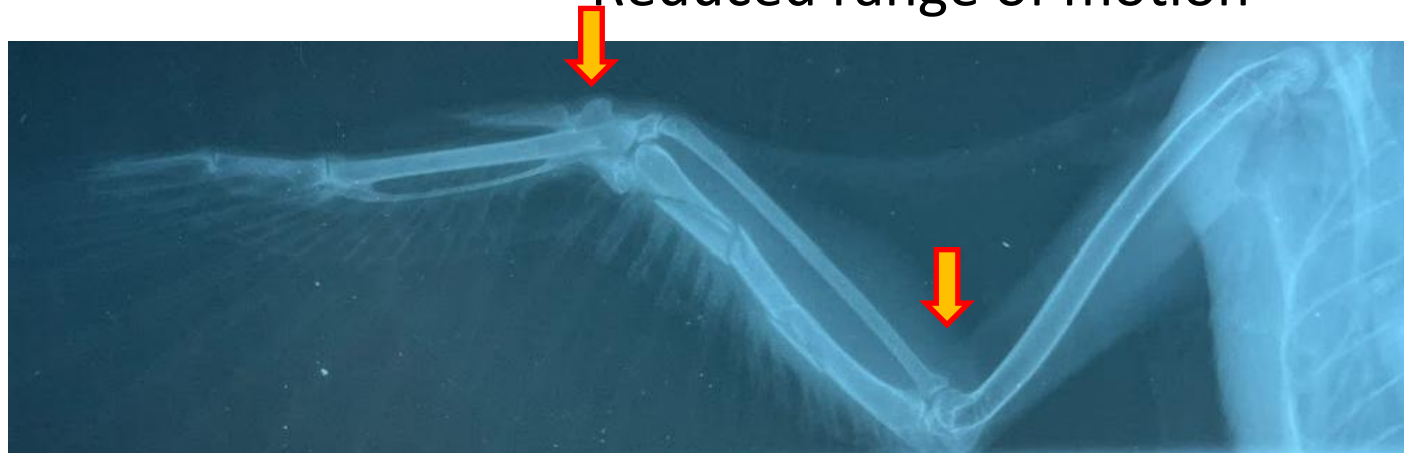
- Usually due to bashing
- Soft tissue swelling
- +/- bone exposure
- +/- osteomyelitis, tendon damage, joint infection, inflammatory changes

Elbows

- Usually due to infection
 - Necrotic skin/scabs
 - +/- adhesion to bone
- Soft tissue swelling
- Joint infection
- Inflammatory change
- Reduced range of motion

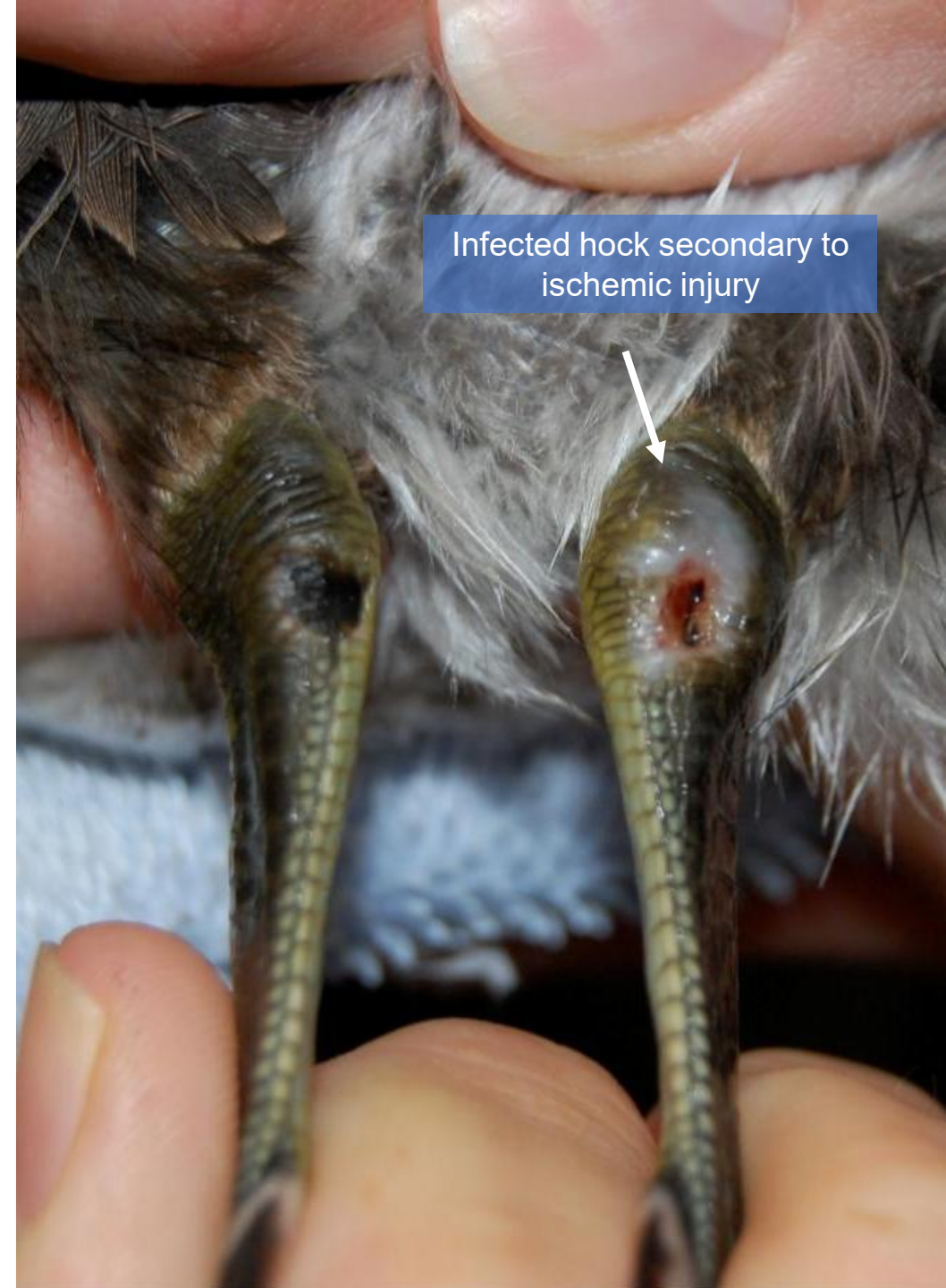
Treatment

- Prevention is better
- Housing adjustments
- Wrists: bumper pads
- Wound care +/- meds
- Elbows: meds and cross fingers



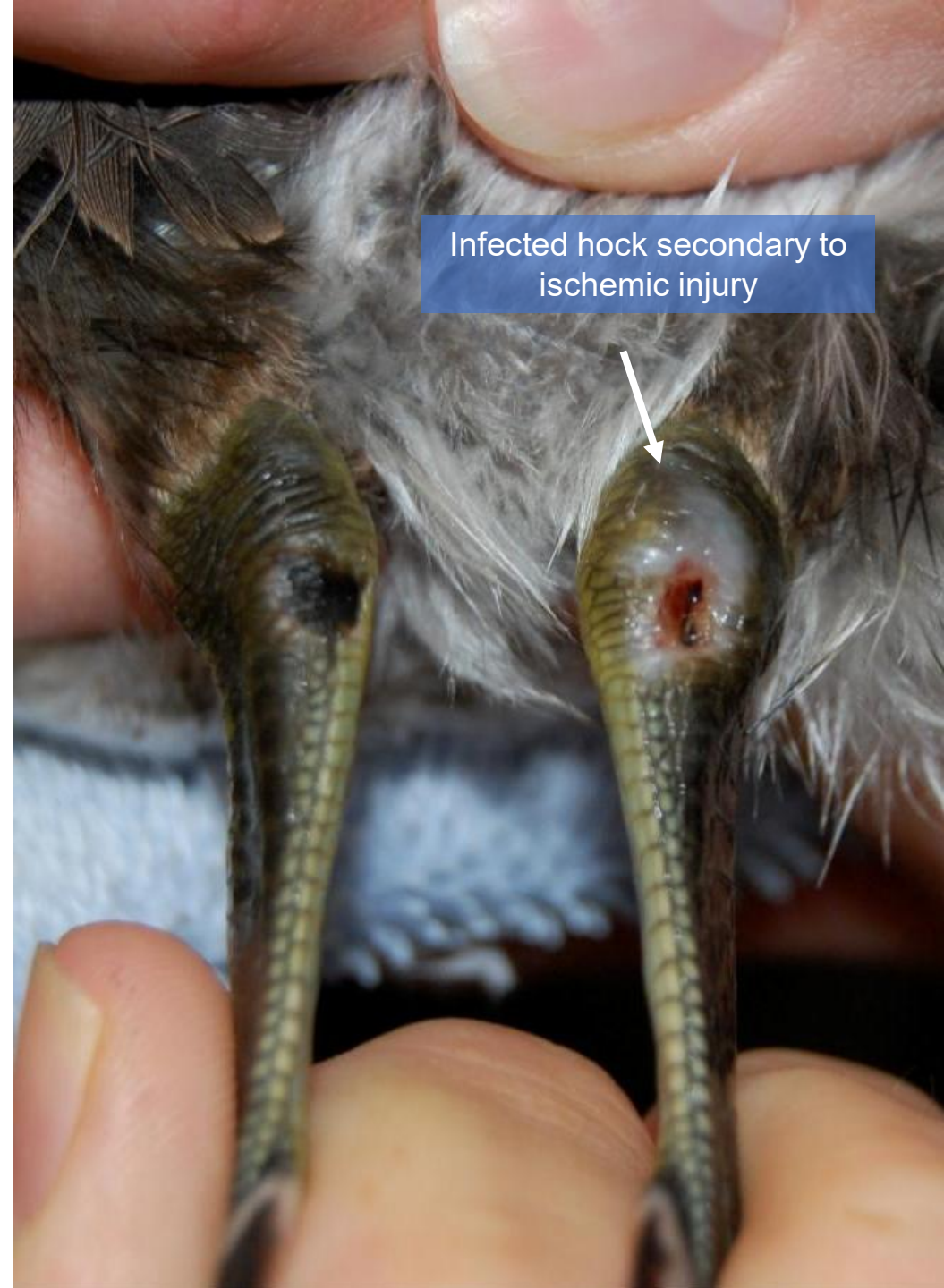
Typical Injuries

- Hock lesions
 - Ischemia → skin death
 - Mild lesions not adhered to deeper tissues = ok
 - More severe lesions: necrotic skin may be adhered to tendon/bone
 - Tendonitis, ascending infection risk



Typical Injuries

- Treatment (my current fave for grebes)
 - Silver hydrogel to soften dead tissue
 - Wound care (+ anesthesia)
 - Debridement of dead tissue, flush
 - Dress with Aquacel Ag+ under hydrocolloid with paper tape to secure
 - Change dressing every 3days



Typical Injuries

- Toes – acute (NOT chronic) pododermatitis
 - Burns and ischemia combo



Western Grebe Dec 2016



Jan 2017



Feb 2017

WEG
16-17
2-1-

Typical Injuries

- Caging or conspecific trauma
- Punctures and lacerations from predators before capture
- Fractures and luxations

Treatment:

- Wound care
 - Meds for pain, infection
- +/- surgery or euthanasia if severe



Toe joint-- open luxation secondary to kicking against hard surfaces in Common Loon

Euthanasia

- Concurrent problems all contribute to prognosis
- “Three strikes” commonly used, oiling definitely counts as strike 1
- Single strikes sufficient to euthanize an oiled bird:
 - Fractures or large contaminated wounds prior to wash
 - Severe burns that will cause the loss of toes or foot
 - Respiratory distress or infections unlikely to resolve with treatment or in aspergillosis-prone species, or those that cannot be kept long term
 - Plumage problems that will render a diving bird unable to be waterproof for a prolonged period of time.

Oiled birds: Summary

- **Not** healthy birds that need a bath
 - Most are unstable patients
 - Commonly enter care at 50-75% normal weight
 - Do not short them on food – they are not healthy zoo animals! Assisted feeding is absolutely necessary until clean and self feeding
 - Renourishment and bodily replenishment nutrient requirements more like rapidly growing infant
 - Minimize stress wherever possible
- Amount of oil not predictive of prognosis
- Rapid rescue = better outcomes
 - Time is of the essence, esp if cold environment/water
 - Most spp lose weight every day until rescue



Thank you for your attention!