Common Diseases of Wild Birds

ERICA A. MILLER, DVM

ERICA@JFRINK.COM

Disease

"a specific state of malfunctioning of an animal body"

Dorland's Medical Dictionary, 20th ed.

Infectious disease = transmissible from one animal to another

- bacteria, virus, fungus, parasite, prion, etc.

Noninfectious disease = toxin, trauma, shock, exertion, nutritional, genetic, etc.

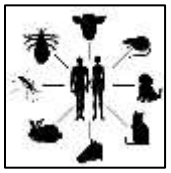
For purposes of this lecture…

Focus on Infectious Diseases:

Microbes
- Viral, Bacterial, Fungal

Parasites
- External & Internal

Toxins



= zoonotic

But first…

Patient Stabilization

- You CAN kill a bird via handling stress
- BRIEF physical exam
- Triage
  - Clean/cover wounds
  - Stabilize fractures
- Initial Therapies
  - Oxygen
  - Fluids
  - Pain management
  - Antimicrobials
  - Eye care

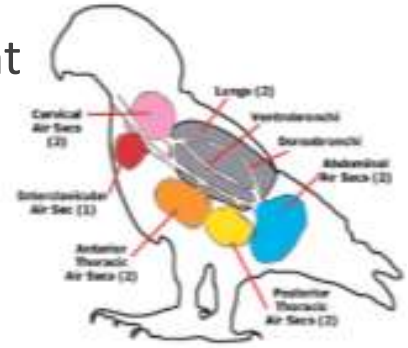
Photo courtesy: Michele Goodman

Note on anesthesia

- Often tempting to immediately sedate for exam and diagnostics
- Birds in shock require supportive care first

Subcutaneous Emphysema

- Minor cases self resolve
- Severe cases may impact leg position, ability to eat, sit or breathe normally
  - Aspirate with sterile needle and syringe
  - Antibiotics +/- NSAIDs
  - May need to repeat treatment



A note on eyes…

Vital for survival

Important part of exam

- Detached retina
- Retinal tears
- Iris damage
- Anisocoria
- Hyphema
- Lens luxation
- Cataracts

Photos courtesy Michele Goodman

Avian Wound Management

Nothing oil-based!

Choose tapes carefully

Be mindful of bandage weight

Keep tissues moist

Birds heal quickly!

Viral Diseases

Often transmitted by a vector

Treated with supportive care

May cause mass-mortalities

What is it?

- Cutaneous/dry form
- Papules on unfeathered skin

Avian Poxvirus

Most strains species specific

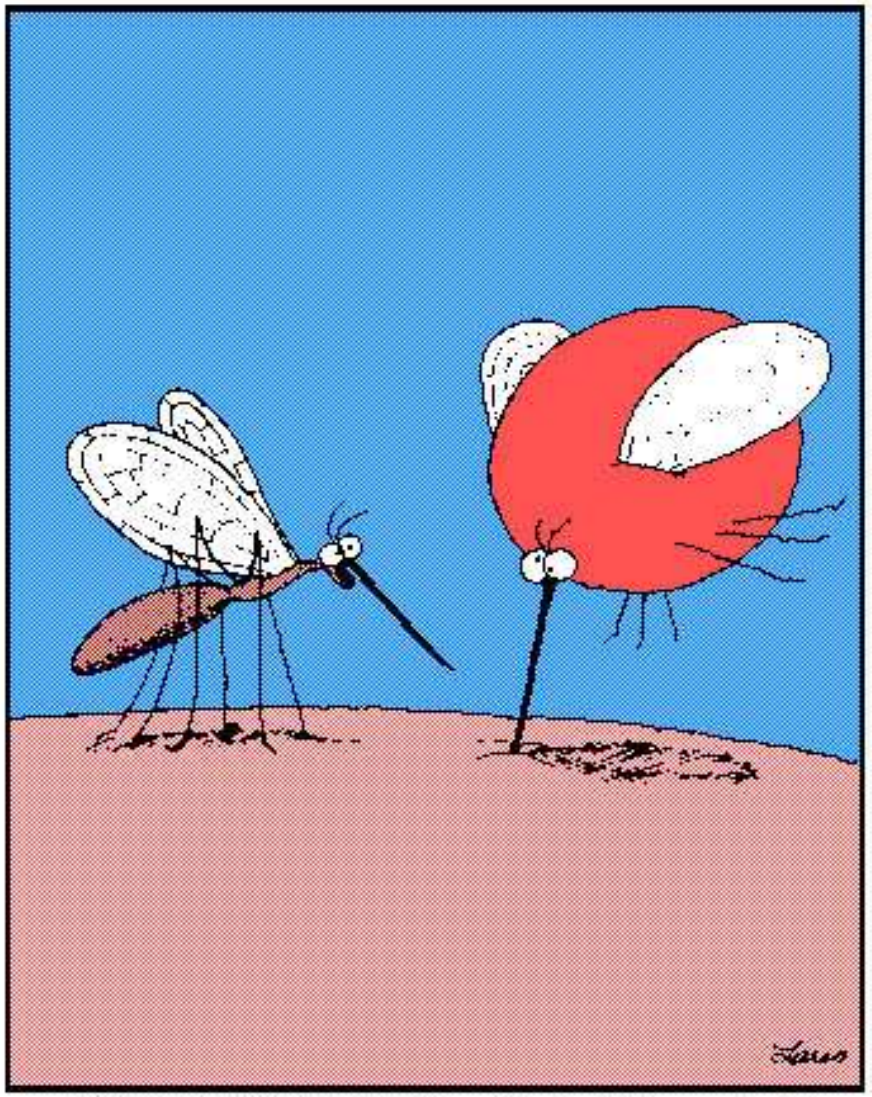
Transmission Mosquitoes, mites, direct contact:

- Mosquitoes infected for 2-8 weeks
- 7-9 days incubation

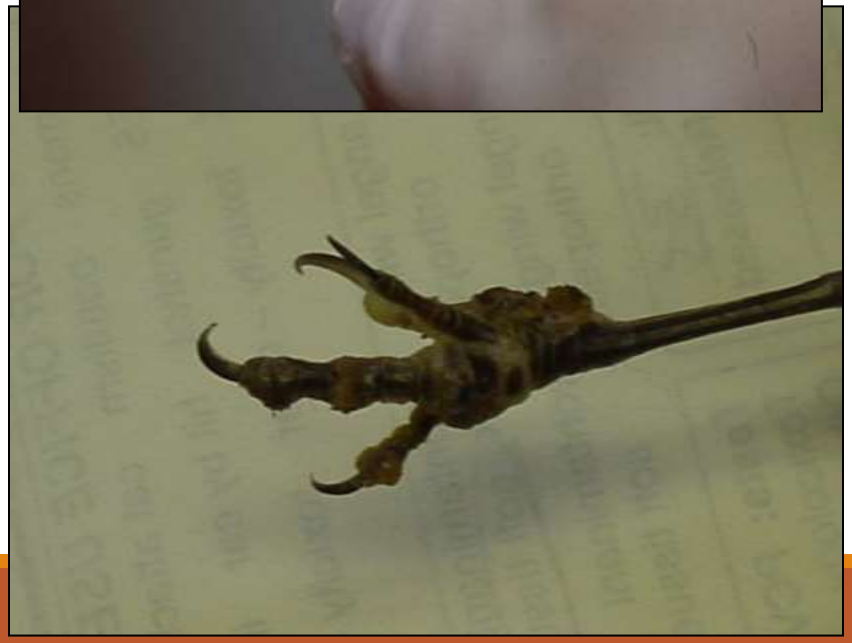
Incubation Virus may remain latent for years

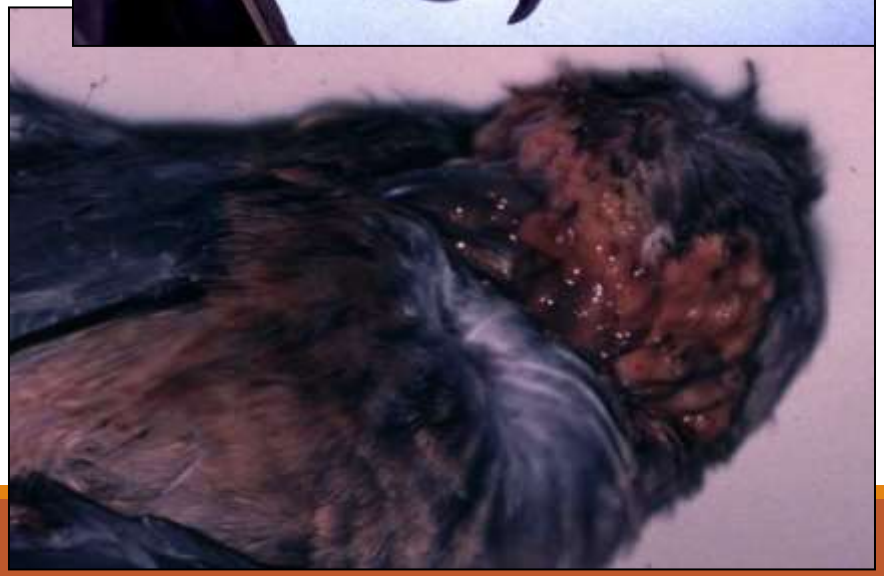
Signs Scabs & open lesions; highly infectious

Recovered birds strongly immune 8 months to life



Disease: Avian Poxvirus





Avian Poxvirus

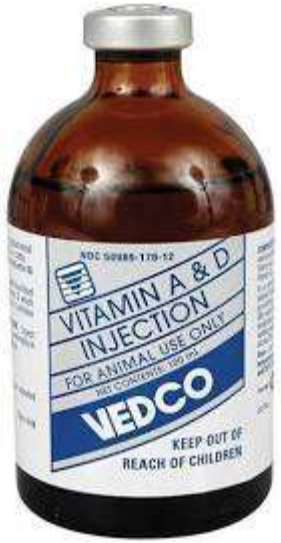
Avian Poxvirus

Treatment

- Supportive care
- Vitamin A
- Iodine topically
- Echinacea
- Antibiotics for secondary infections

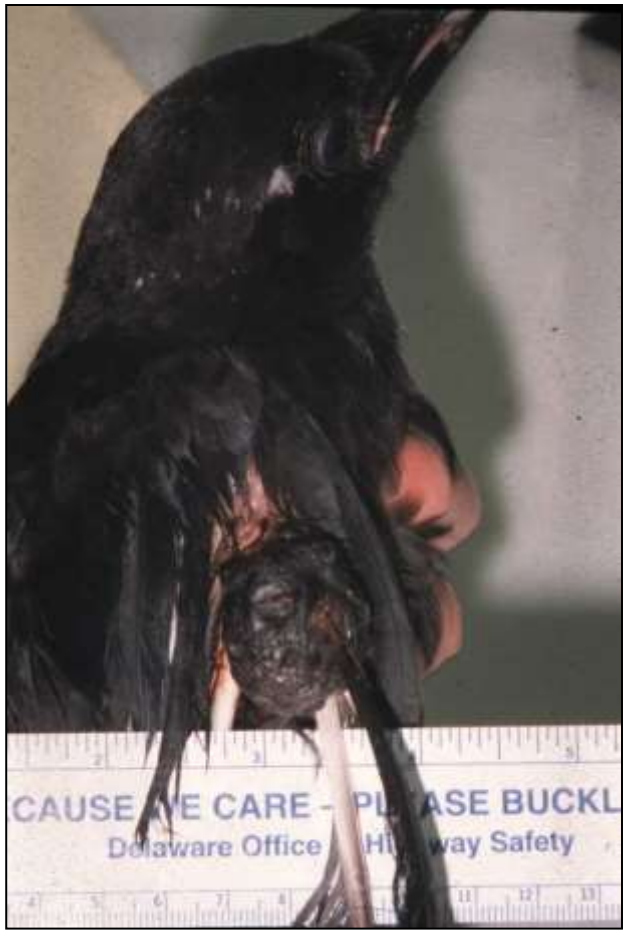
6ml Tylan 50 or ½ tsp Tylan powder
100ml Sterile water
1.5ml Betadine

Mix and apply topically



What is it?

- Abscess-like tumors hemorrhage readily & recur
- Very poor prognosis



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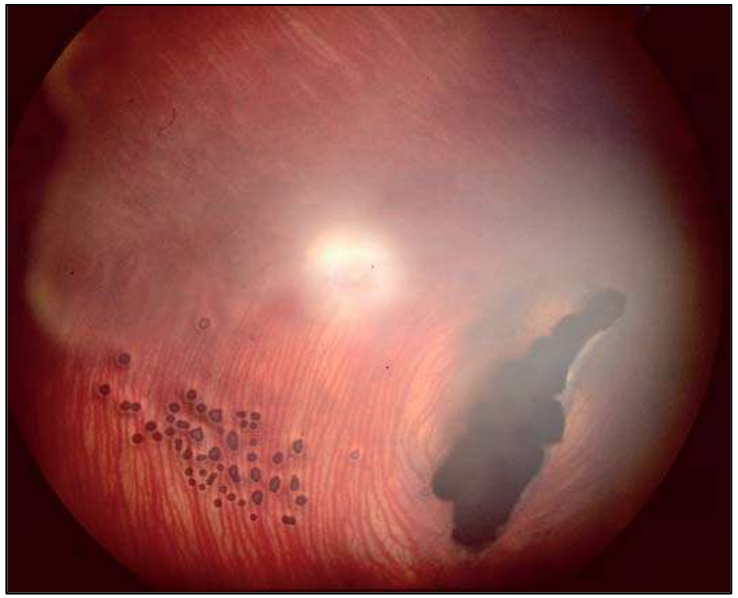


- Chorioretinitis (also seen w/toxoplasmosis)
- Feather damage (poor exsheathing, abnormal growth, etc.)
- Myocarditis

What is it?

West Nile Virus (WNV)

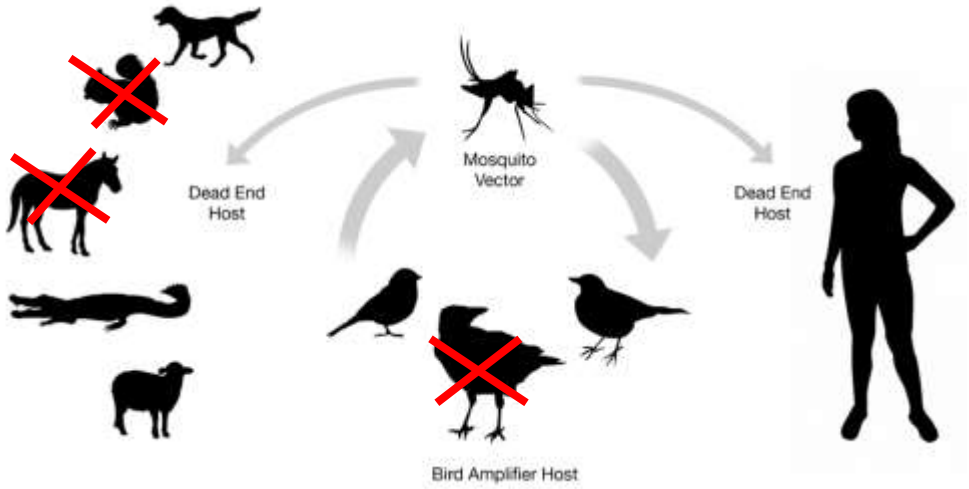
Arbovirus (*Flavivirus*)

Species Corvids, Raptors
- Passerines may be reservoirs

Transmission Mosquitoes; direct contact, fecal ingestion

Clinical Signs Paralysis, seizures, ataxia, diarrhea, sudden death

Dx Antibody or Antigen testing



Meningitis in humans & horses

Pathogens **2020**, *9*(1), 48; https://doi.org/10.3390/pathogens9010048

WNV Treatments

Basic supportive care

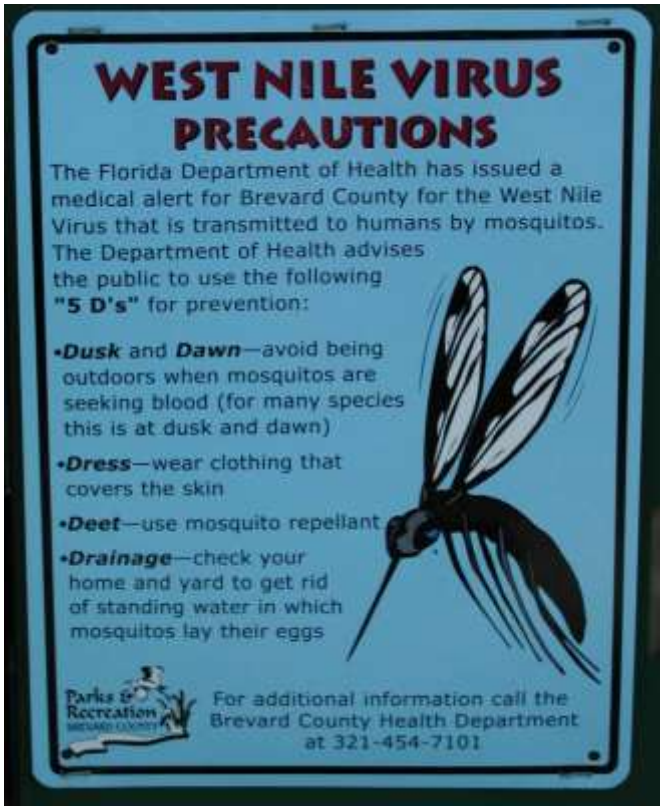
- Warmth & fluids
- Supportive feeding
- Treat ectoparasites
- NSAIDs
- Vitamin B complex

Duration of immunity?

Long-term effects?

Carriers?

Reportable Disease

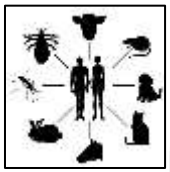


What is it?

Inflammation of CNS:

- torticollis, ataxia, tremors, paresis
- **weakness of leg(s) & wing(s)**
- clenched toes
- can dive but can't fly
- live birds fall from roosts

+/- bloody diarrhea



Newcastle Disease Virus

Avian paramyxovirus-1 [PMV-1]

Species Over ½ all orders of birds

- NDV die-offs in cormorants, gannets, shags, pelicans and gulls
- Endemic in cormorants in US
- Maintained in adults
- Periodic outbreaks in juveniles

Has spread to domestic poultry several times

Treatment Euthanasia required

Reportable Disease

What about this?

Pigeon with torticollis (twisted neck)

Can’t stand

Intermittent seizures with uncontrolled wing flapping

Another pigeon housed with it has no signs of illness at all

Video of same bird….

Pigeon Paramyxovirus-Type 1

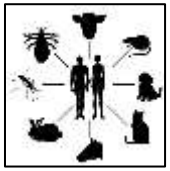
PPMV-1 not known to cause NDV in other species; highly contagious pigeons

Signs: PPMV strains cause a range of infection, from no signs to rapid death; stress may induce it

Potential to mutate to PMV-1?

Killed NDV vaccine available

Mild flu-like symptoms in humans



What is it?

Species Waterfowl, shorebirds, raptors

- Common starling refractory

Signs Lethargy, anorexia, CNS signs, death

- Pancreatic necrosis; splenomegaly, edema

Dx PCR or virus isolation

Risk to poultry & humans?

Reportable Disease

Swans in Dorset

Mallard in Montana in 2015

Current HPAI H5N1

In Newfoundland/Labrador in Nov/Dec 2021

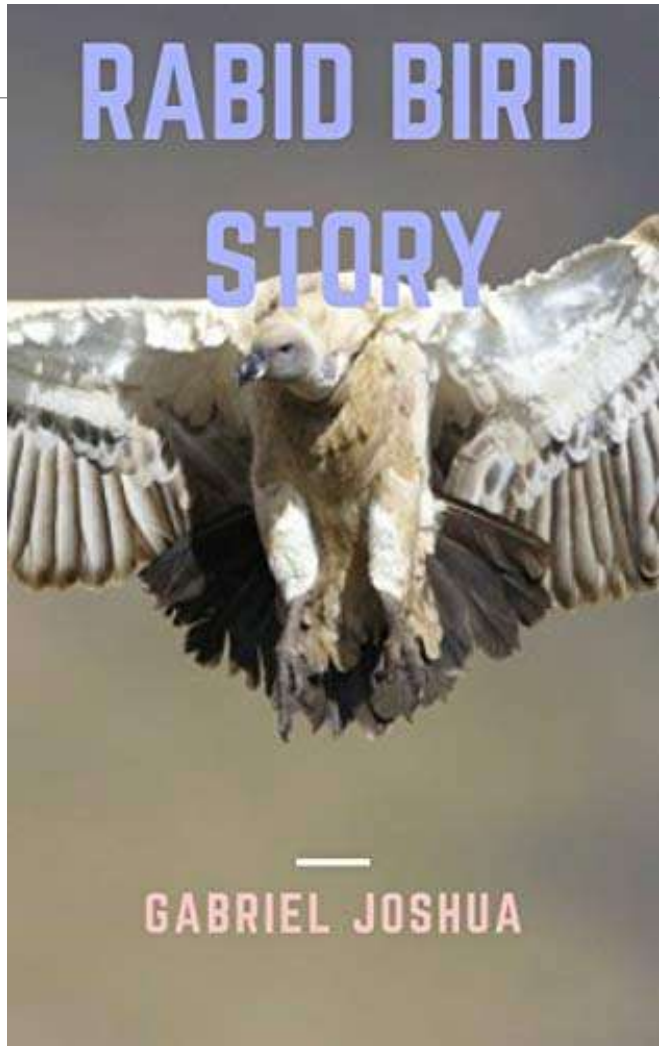
- Mixed bird farm
- Great Black-backed Gulls

91 cases in waterfowl in US since 1 January (as of 8 Feb)

- South Carolina
  - American Wigeon, N. Shoveler, Blue-winged teal
- North Carolina
  - Gadwall, Woodduck, Am. Wigeon, Mallard, N. Pintail
- Virginia
  - Am. Green-winged Teal, Mallard
- Florida
  - Blue-winged Teal
- Maryland
  - Lesser Scaup

Rabies

- No record of a bird transmitting rabies to another animal or person
- Birds found to with rabies antibodies
- An experimentally infected owl did shed rabies virus in the oropharynx



Bacterial Diseases

May often be cultured and treated with appropriate antibiotics

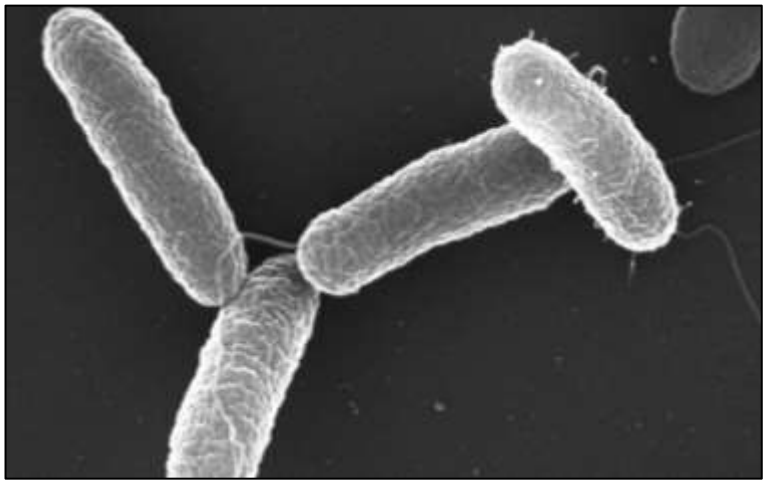


Photo: Volker Brinkmann

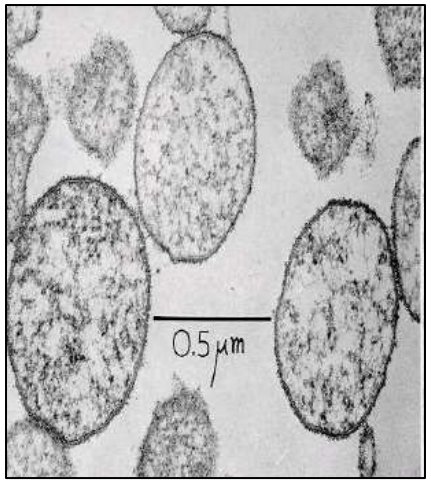


Photo: TVD Rao, MD

Mycoplasma conjunctivitis

Species house finches; goldfinches, blue jays, starlings

Photo: Sallie Welte, VMD

Mycoplasma conjunctivitis

Mycoplasma gallisepticum

Species House finches, gold finches, starlings, blue jays

Treatment Topical ophthalmic drops q12h until eyes clear;

Tylosin tartrate in water, 1mg/ml (1/4 tsp per qt) for 21 days

Salmonellosis

Often *S. typhimurium*

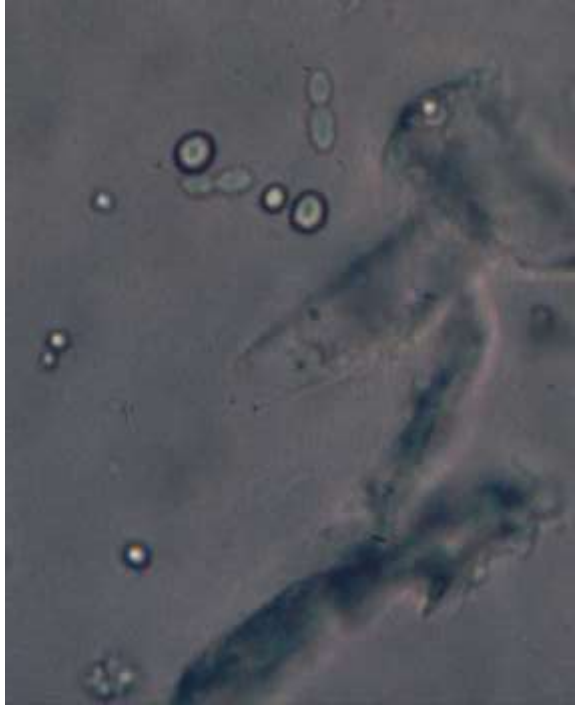
Species pine siskins, redpolls, and goldfinches

Transmission Carrier birds; fecal ingestions

Signs Fluffed, lethargic, swollen eyelids, dehydration

- Inflammation & necrosis of crop, enteritis

What is it?



Fungal Diseases

Associated with stress and poor ventilation

Filamentous or yeast forms

Thrush

Candida albicans

Species Most birds; esp. swifts and mourning doves

Signs Thickening of oral mucosa & pseudo-membranes or diphtheritic plaques

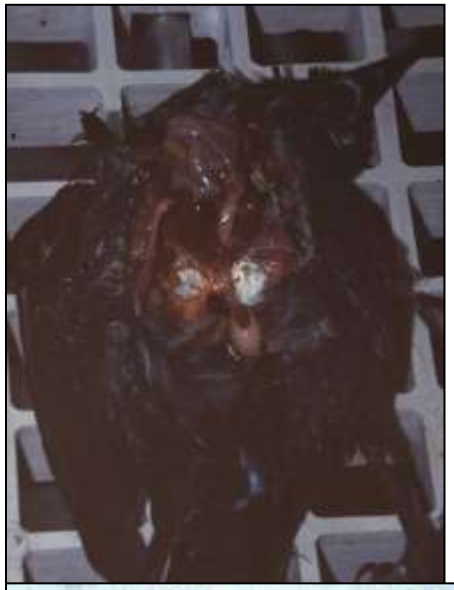
- Normal flora—invades mucosa when host is debilitated

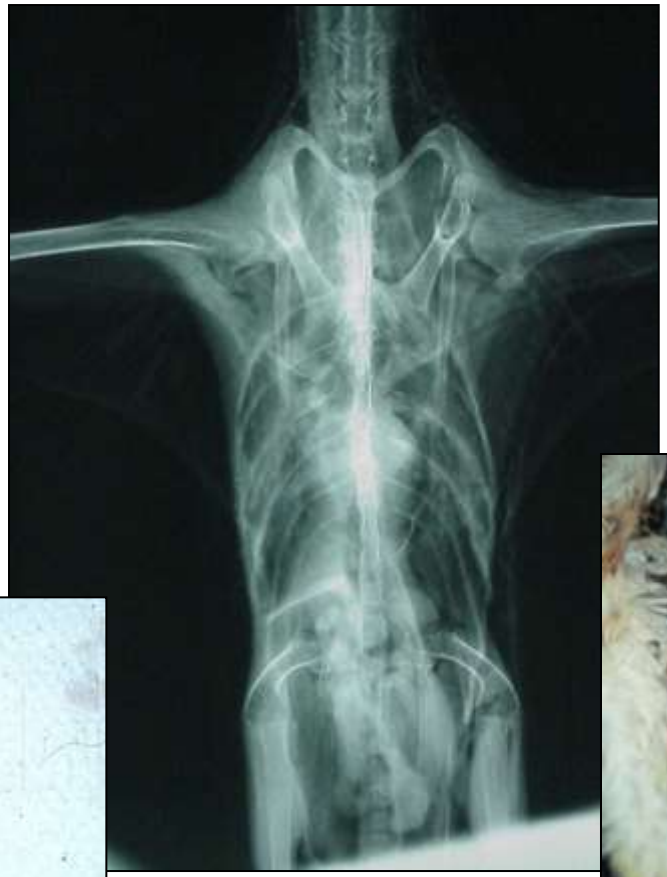
Thrush

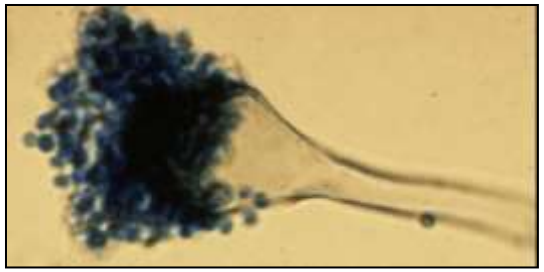
Treatment Nystatin PO q12h for 7-14 days – apply to lesions

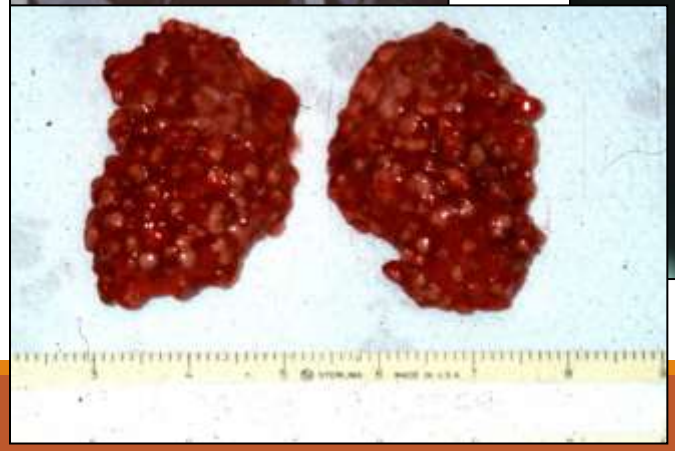
Can be spread via nectar feeders

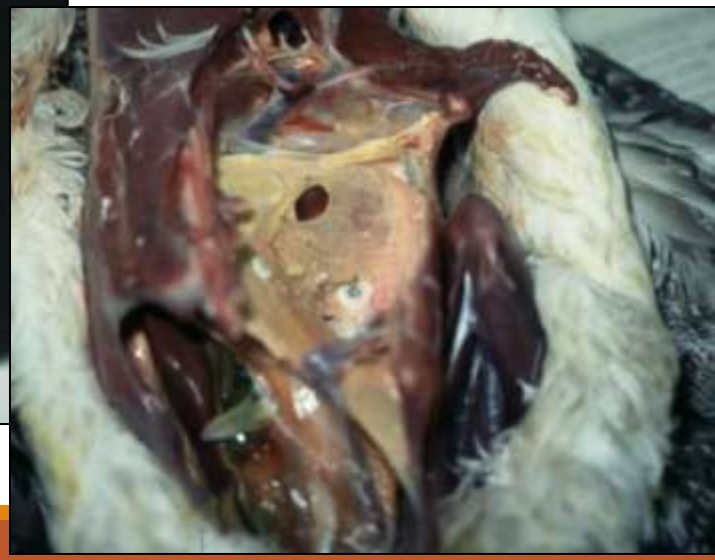
What is it?

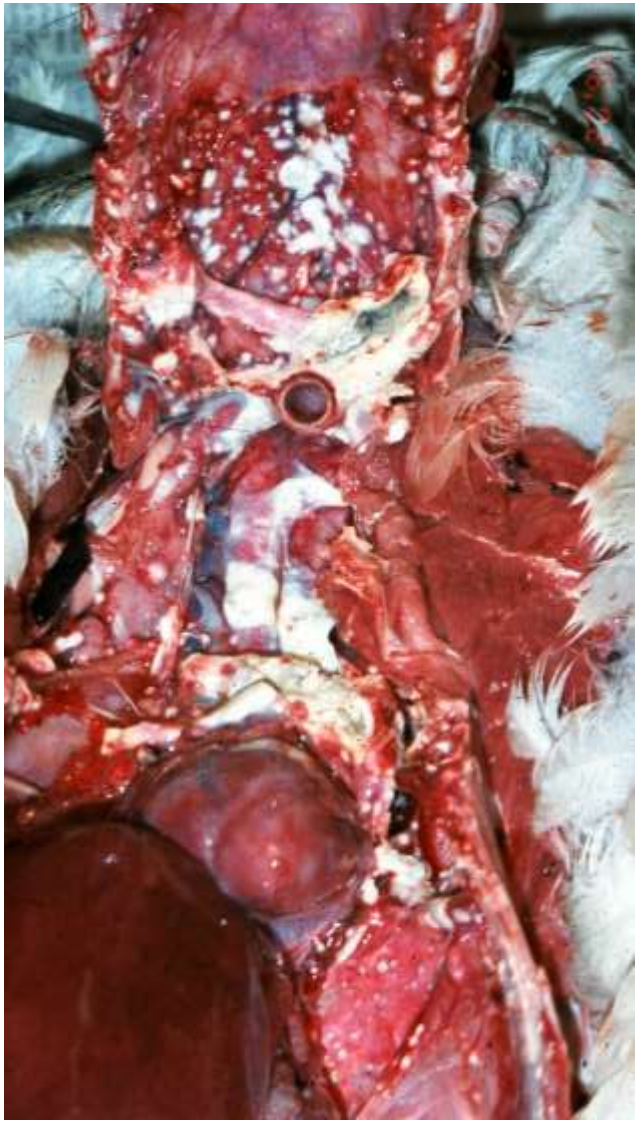


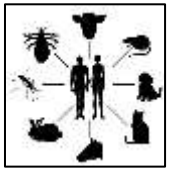












Aspergillosis

Aspergillus fumigatus

- ‘Land-associated’

Species Seabirds or immunosuppressed individuals

Signs Usually weight loss; regurgitation, respiratory, neuro

Aspergillosis

Treatment

- Nebulization
- Surgical debridement
- Oral azole antifungals

Prevention is key

- Ventilation
- Avoid straw bedding
- Prophylactic antifungals

Common Parasites of Wild Birds

External

Ticks

Lice

Mites

Hippoboscids

Maggots & Bots

Internal

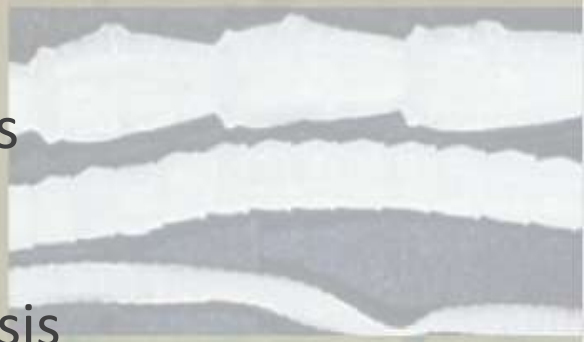
Tapeworms

Roundworms

Gapeworms

Trichomoniasis

Coccidia



Ticks

Argas sp. most common

Tiny gray ticks around eyes and featherless areas

Anemia, disease transmission

Remove carefully

Ivermectin or Fipronil

Robin photo: C Driscoll

C. Grackle photo: J Vaughn

SNOWY OWL

Good body condition

Caught in warehouse

Lice

Order Mallophaga

- Lacey appearance to feathers
- Nits on feathers
- Lice crawling on bird
- Pyrethrin spray or powder

Fledgling Oriole

Specks (<1mm) crawling on feathers or you

Avian skin mites

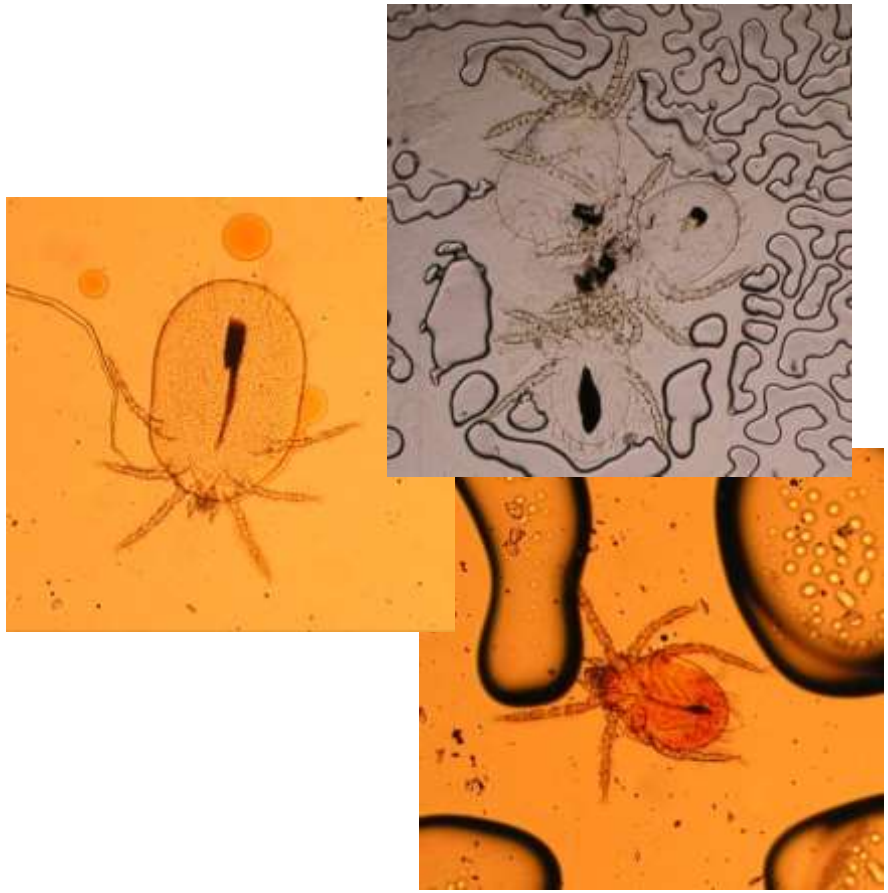
Cheyletielidae, Analgesidae & Dermoglyphidae

Anemia and irritation of skin

May transmit disease or cause anemia

Treatment

- Pyrethrin-based spray or powder
- Ivermectin



Bald Eagle

Immature bird

Thickened skin on head and neck

Photo credit: Peter Fimrite, UCD

Robin

Thick proliferation on feet and legs

Hyperkeratosis of feet, legs and occasionally beak; feather loss on face

Scaly leg mites

Knemidocoptes sp.

- **Dx** Skin scrapings to examine for mites or mite eggs under microscope
- **Treatment** Ivermectin, selamectin, or Scalex®

Chimney Swift

Folliculitis; rough, nodular, crusty skin (yellow skin cysts and tumors)

Diagnostics?

Skin scraping or biopsy of lesion to examine for mites or mite eggs

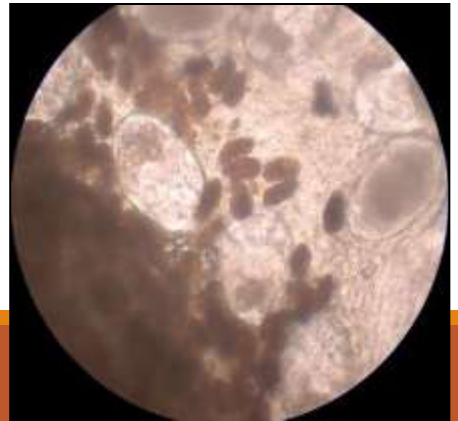
Avian follicular mites

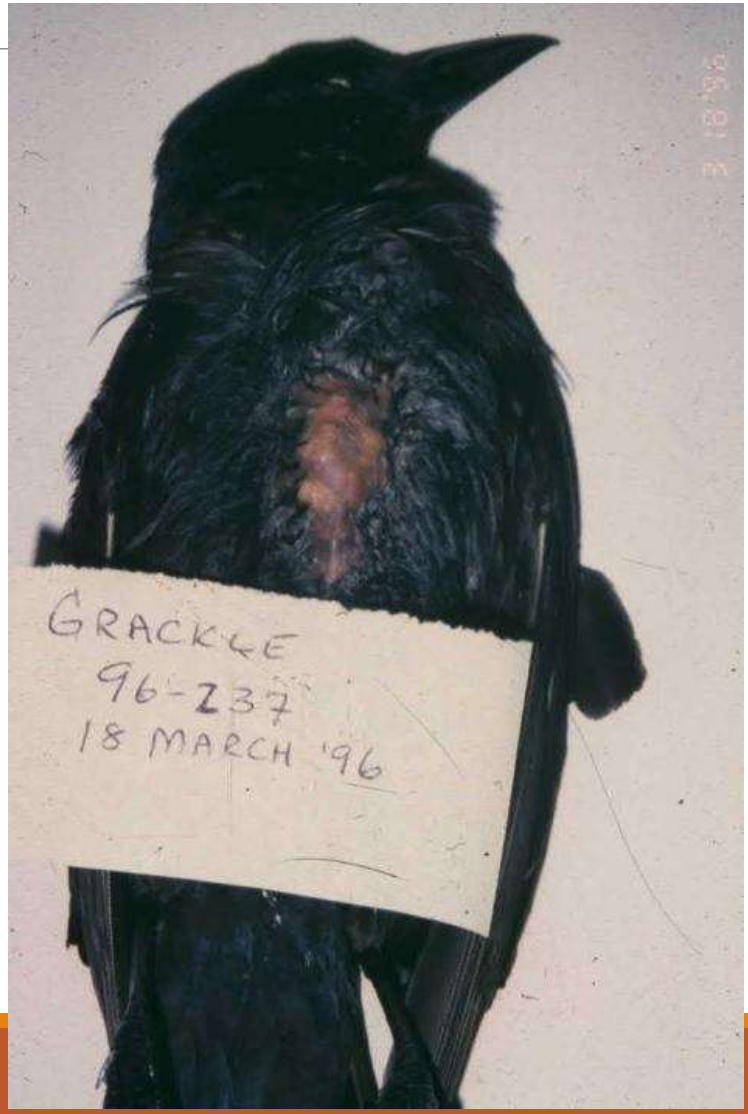
Harpyrynchus spp.

Oval mites and eggs embedded in skin

Treatment Ivermectin

Most common in COGR and BHCO





Carolina Wren

Stuck to glue trap

During exam, you notice the ears look orange

How do you determine the cause?

Avian ear mites

Swab & examine microscopically

Tissue damage

Secondary infection

Treatment Ivermectin

Flat flies

Hippoboscidae

Flies "run" across the surface feathers then "dive" under feathers

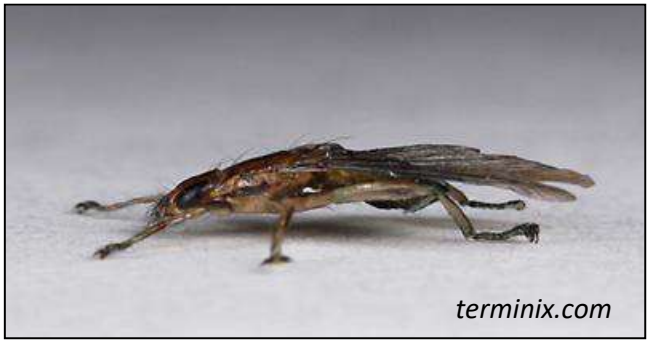
May transmit disease or cause anemia

Flat flies

Treatment

- Pyrethrin spray BID
- Pyrethrin or carbamate powder SID

(http://edis.ifas.ufl.edu/in584)



Wood Thrush and Robin

Cutaneous Warbles

Larval form of the bot fly (*Cuterebra*)

Treatment

- Ivermectin or nitenpyram (Capstar®)
- Remove carefully to avoid anaphylaxis
- Local lidocaine
- Flush cavity left by larva

Peregrine nestling

Nest flooded in heavy May storm

Two older chicks okay, but biologist brings in this one

Weak and cold

Spots on feathers and dark areas under wings

What is the cause?

Carnid Flies

Carnus hemapterus

Flies under feathers and in ears

Nestling raptors

Characteristic wings that are abruptly cut off

Cause anemias; may transmit disease

Treatment?

Carnid Fly Treatment

Pyrethrin spray

Pyrethrin or carbamate powder

Treat the nests prophylactically

Common Myiasis

Flies deposit eggs on moist areas

Larvae hatch in 8 to 20h

Feed on dead tissue/fluids

Treat with ivermectin or nitenpyram (Capstar™)

Endoparasites

Diagnose via fecal smear or flotation

General classes of: hooks, rounds, whips, tapes, flukes, coccidia

Treat accordingly if symptomatic

Sample Collection

Fresh!

Feces—not urates

If not examining immediately:

- Place in sealed container in refrigerator

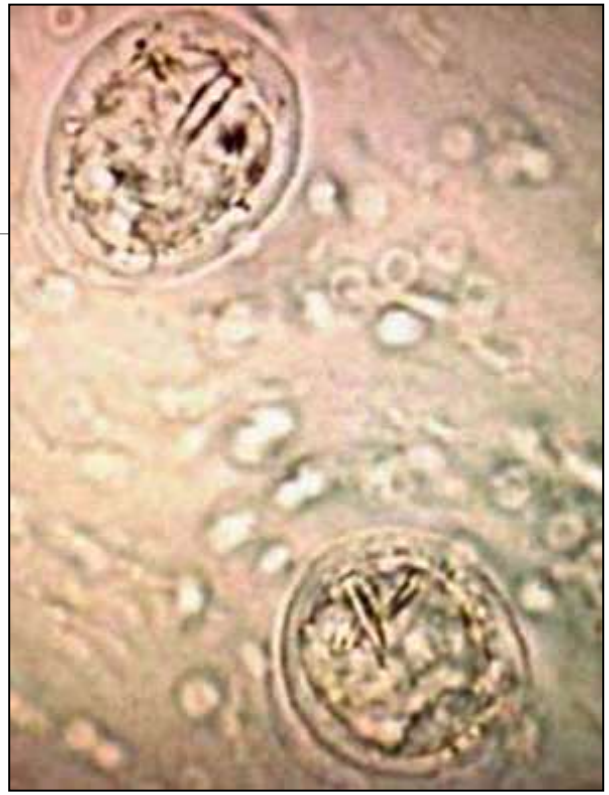
Tapeworms (cestodes)

Diphyllobothriidae, Tetrabothriidea & Cyclophyllidea

Transmission Require intermediate host

Signs impactions or weight loss when large #s

Dx eggs seen on fecal smear or flotation



Tapeworms

Long sections may be passed in feces of birds

Treatment: Praziquantel (Droncit®);
repeat in 2 wks

Mourning Doves

July: 2 dozen + birds in 10 days

All had neurologic signs (torticollis, ataxia, seizures)

All died emaciated

No treatment was working

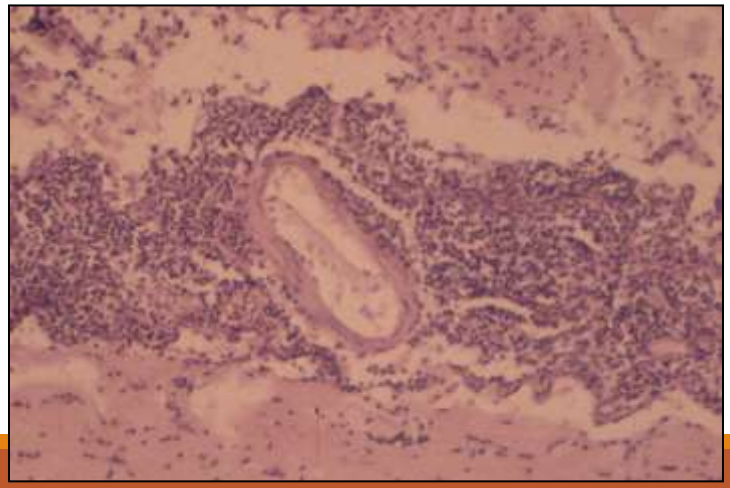
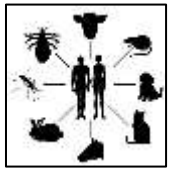


Photo: Sherry J. Morgan, DVM



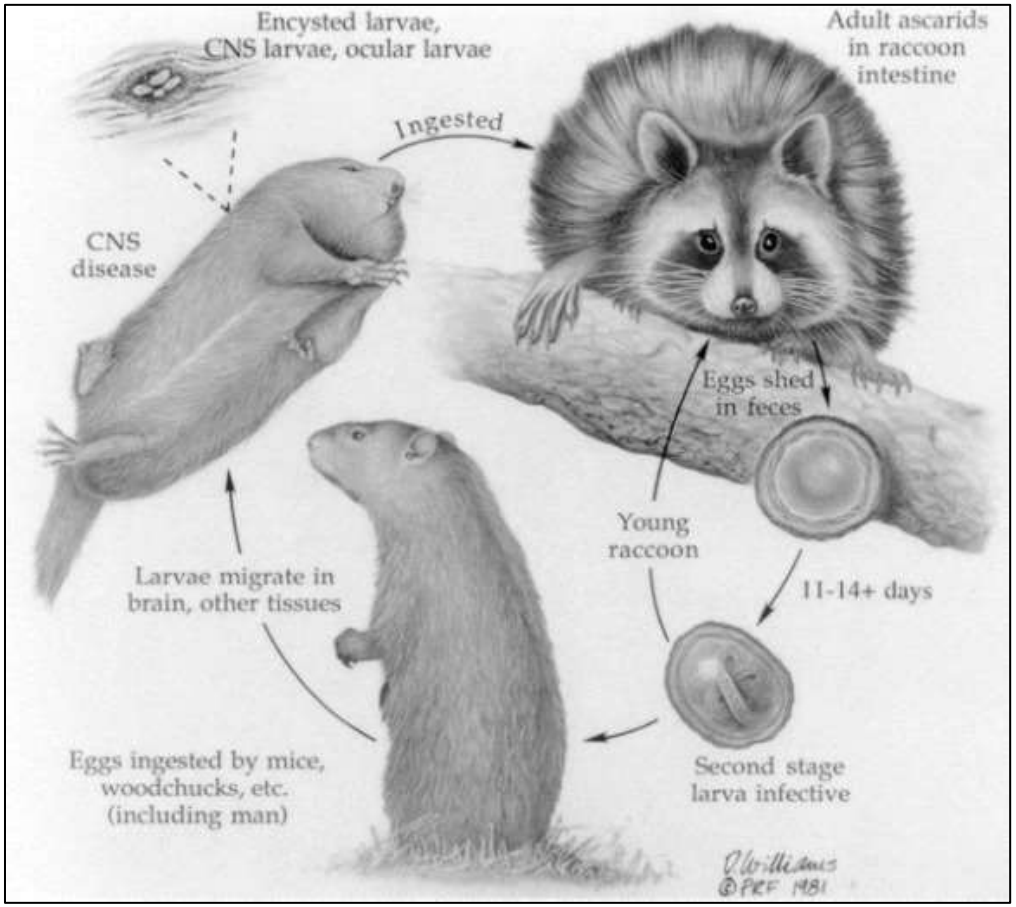
Visceral Larval Migrans

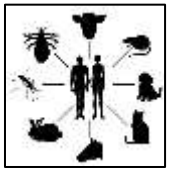
Cerebral nematodiasis

Raccoon roundworm
Baylisascaris procyonis

Fecal / oral transmission

CNS signs, ocular lesions, death





Great Blue Heron

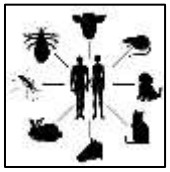
Weak, not standing

Thin body condition (1-2/5)

Anemic: PCV = 12%

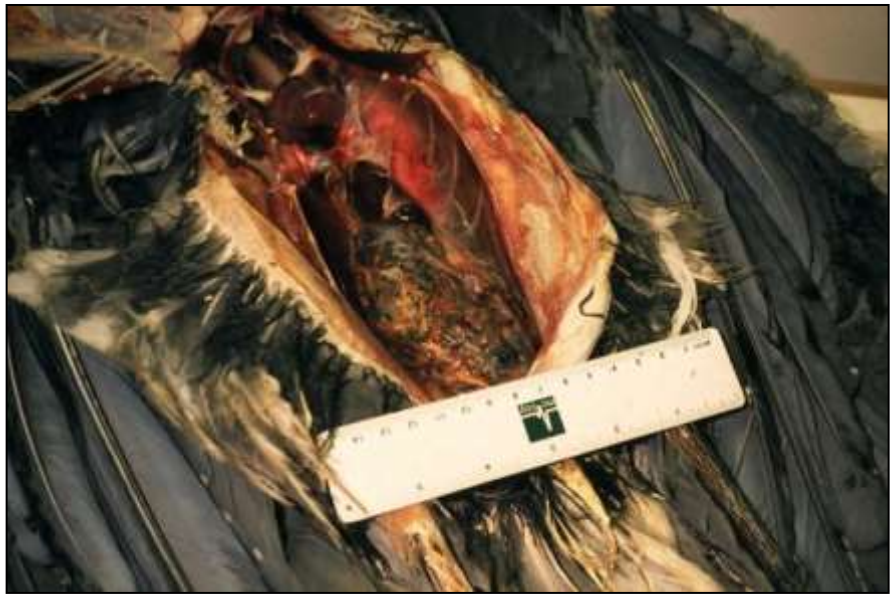
Palpate a “lumpy” abdomen

Often with oral flukes



Eustrongylides ignotus

- Piscivorous birds
- Bore thru proventricular wall
- Can palpate tubular tracts in abdomen
- Anemias and 2° infections
- May see ova in fecal exam



Cooper's Hawk

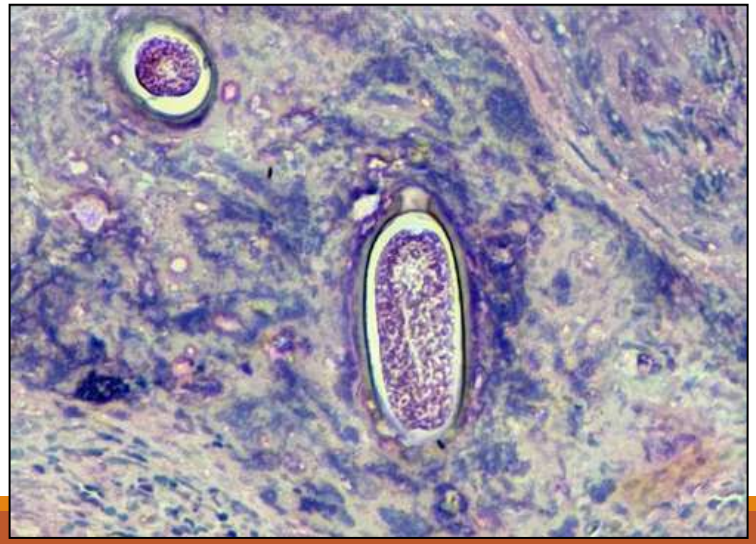
- Caught on migration
- Thin
- White caseous material at commissures

Threadworms

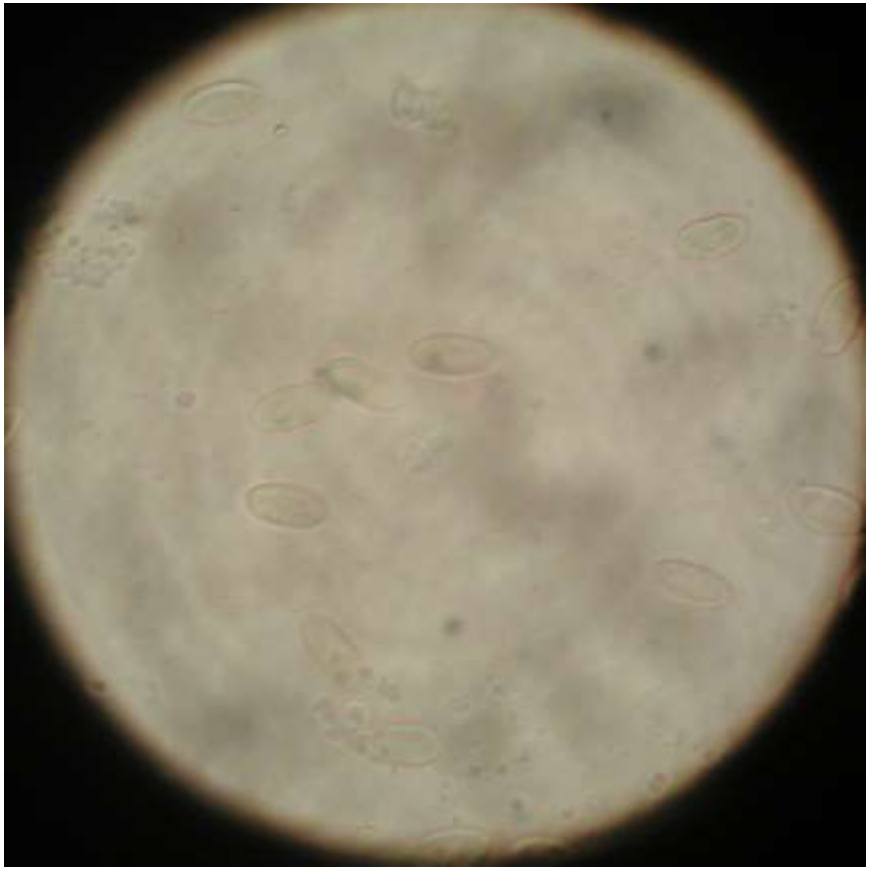
Capillaria

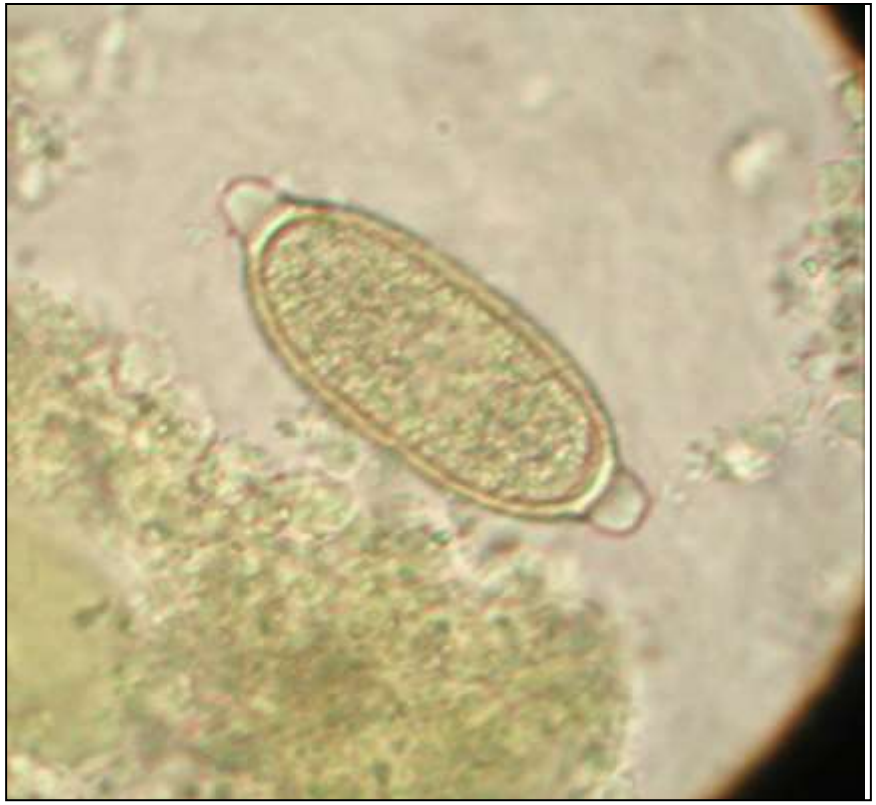
Diarrhea +/- blood

Bipolar ova



Direct Smear



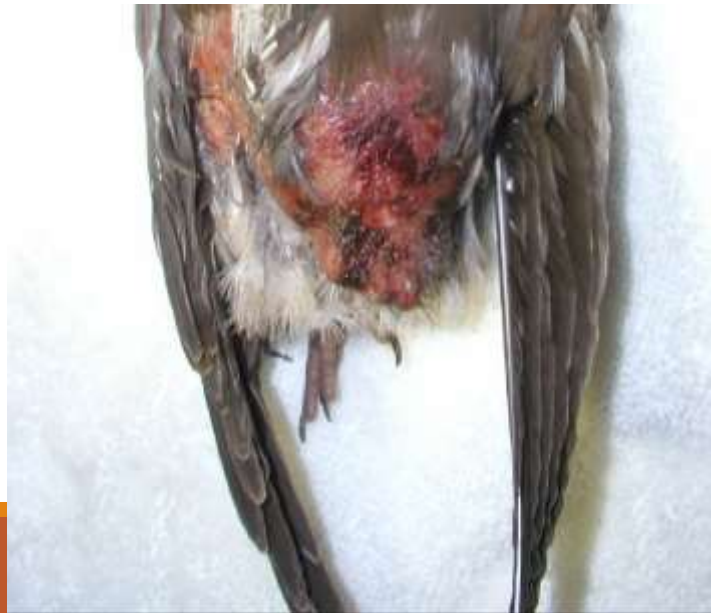


Treatment

- Fluids! And general supportive care
- Fenbendazole (Panacur®)
- Gavage feeding
- Wear gloves
- Careful disinfection of gavage tubes

Mourning Dove

- Adult
- Caught by cat
- Slightly thin
- Missing tail; has small punctures on rump; otherwise BAR



Treatment

- Fecal exam – negative
- Broad spectrum antibiotic (Clavamox®)
- Fluids
- Meloxicam, at least day 1
- Clean wounds

1 week later…

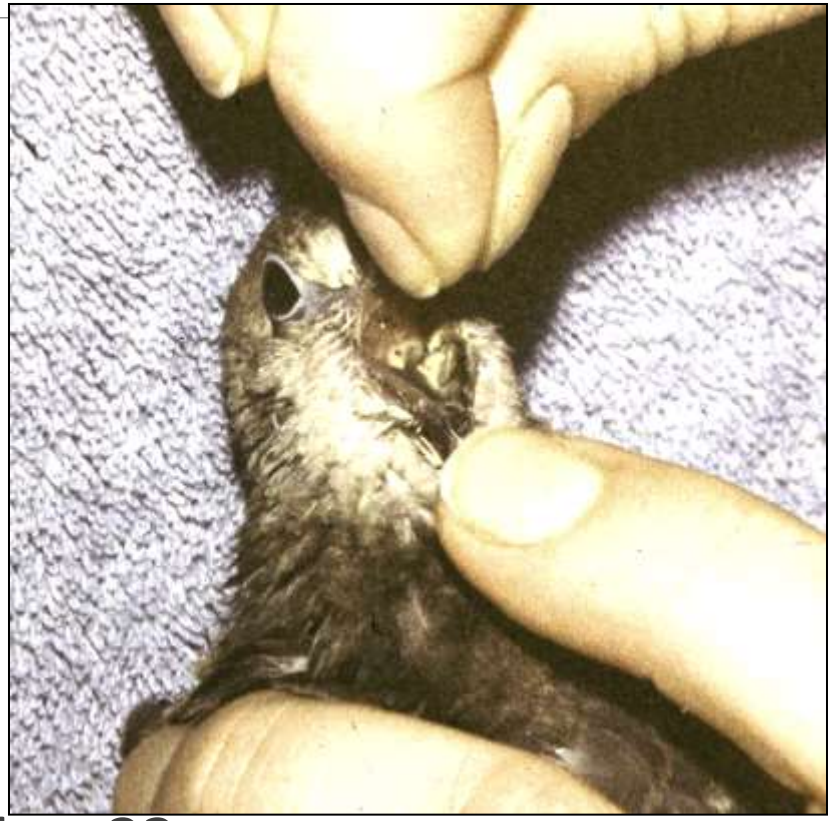
Done with antibiotics

Moved in with other doves

Lethargic

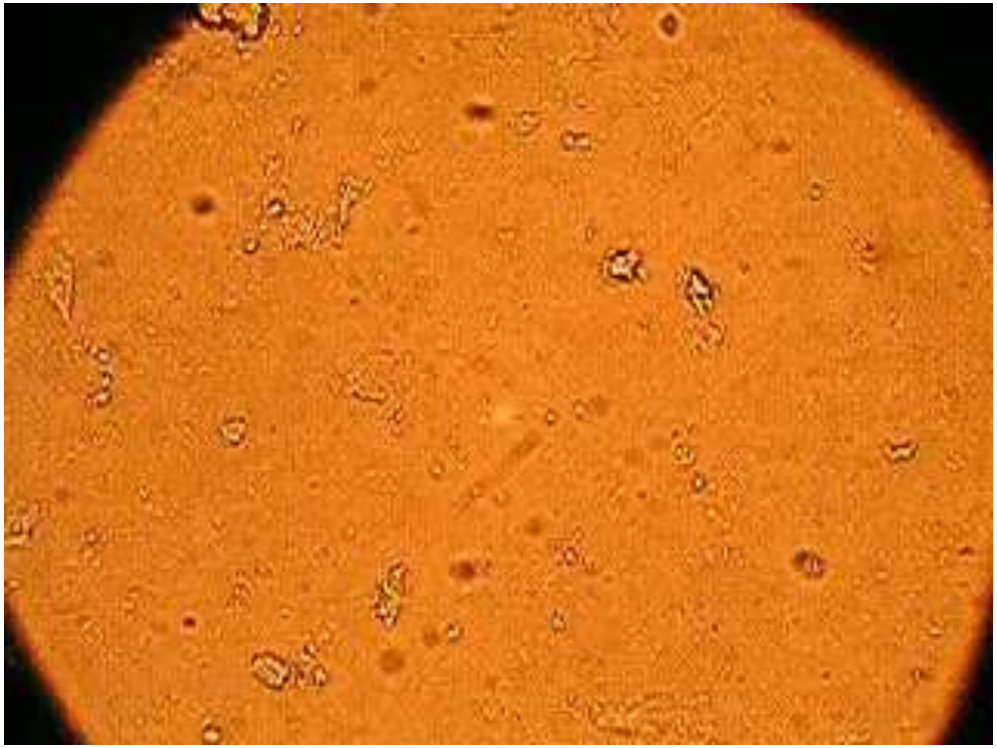
Losing weight

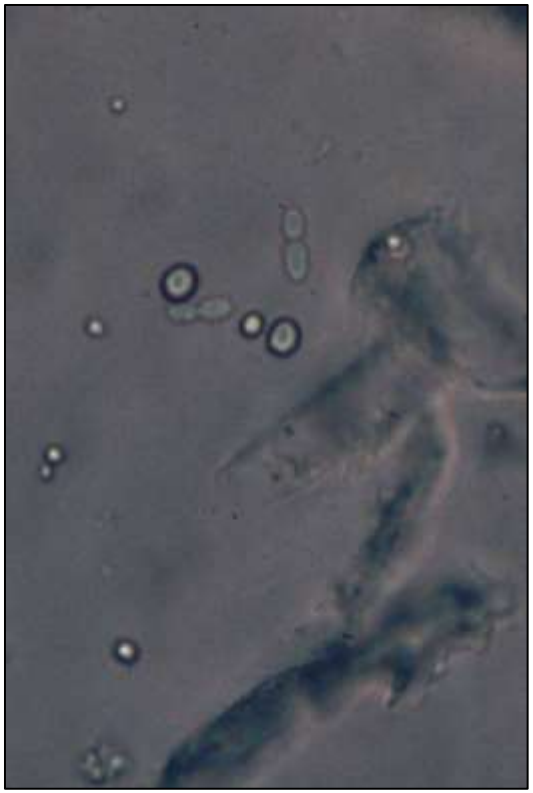
Caseous material in mouth



How do we diagnose the problem??

Direct Smear

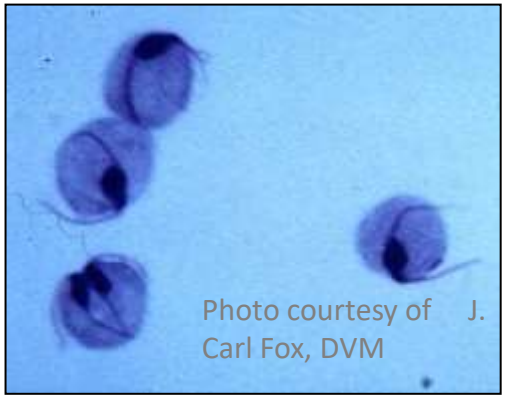




Treatment

Trichomoniasis

- Carnidazole (Spartrix®)
- Metronidazole (Flagyl®)
- Ronidazole (Ridzol® or Daczol®)



American Robin

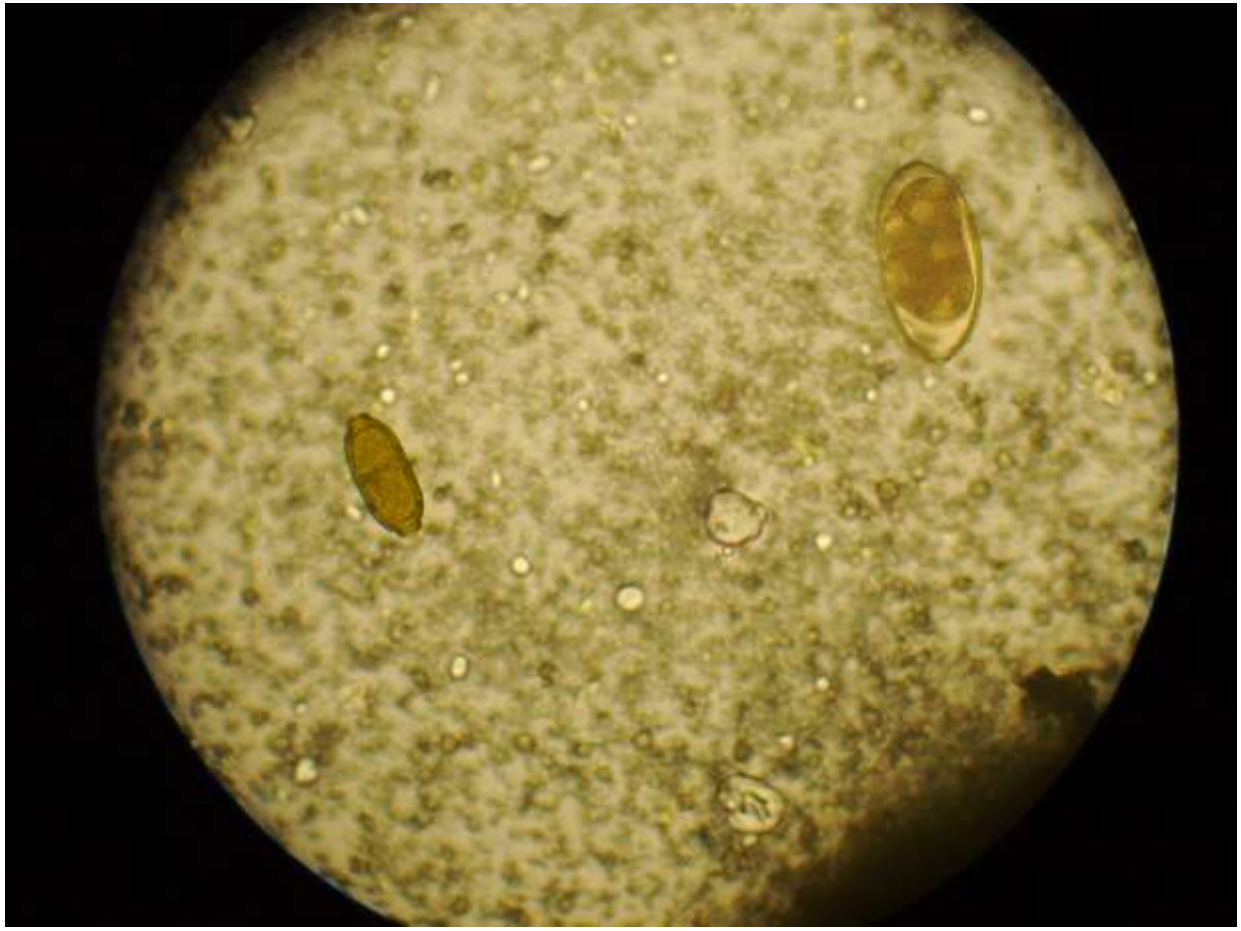
HY robin, housed outdoors with 4 other robins

Lethargic, thin

Coffee-ground droppings

What do you do?

Fecal Exam – Direct Smear



Treatment & Prevention

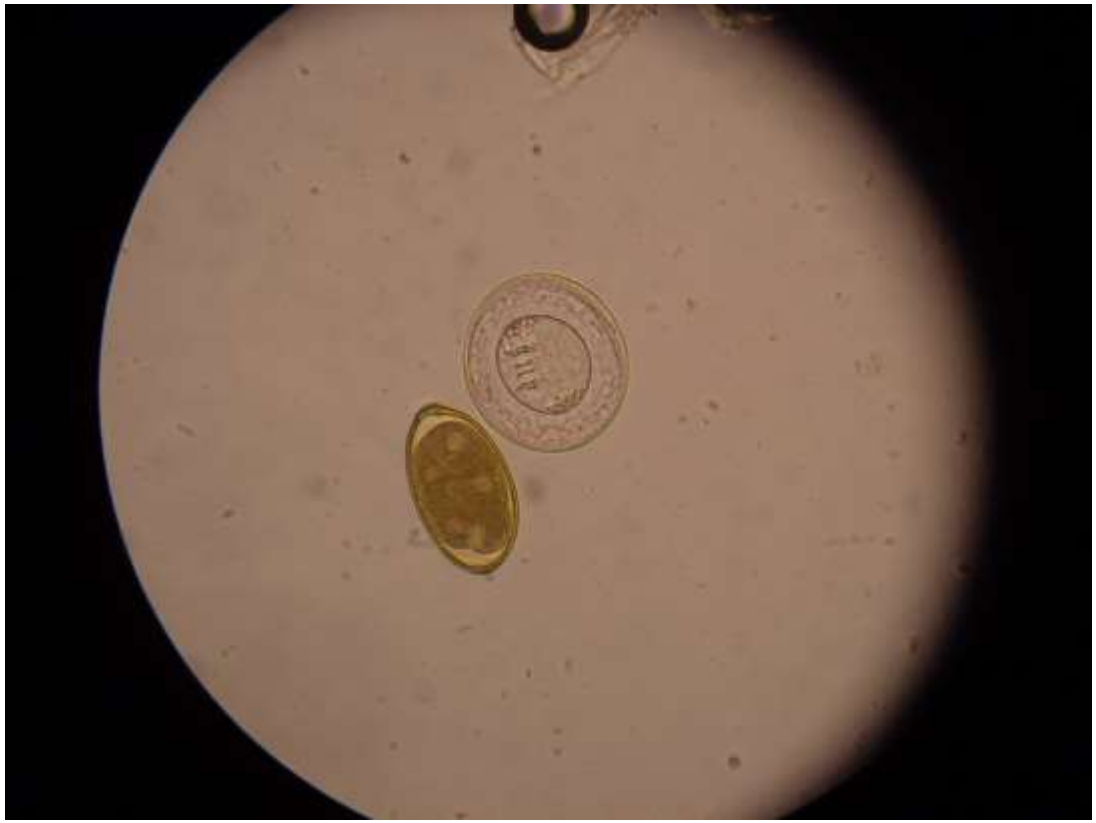
Treatment Options

- Ivermectin
- Fenbendazole
- Pyrantel Pamoate

Prevention/Concerns?

- Both may have direct life cycles
- Clean cage & wash hands
- Keep bird isolated
- Check/treat birds in outside cage

Fecal Flotation—1 wk later



Treatment for Outside Birds?

Treat the Syngamus & Capillaria first

- More immediately harmful
- More transmissible
- Tapeworms have indirect life-cycle

Weigh birds & eval for further treatment

Other Concerns/Prevention?

Disease Transmission

- Clean dishes & feeding implements daily
- Consider footbath outside enclosure

When to Release?

- Re-fecal in 7-10 days

Disinfection

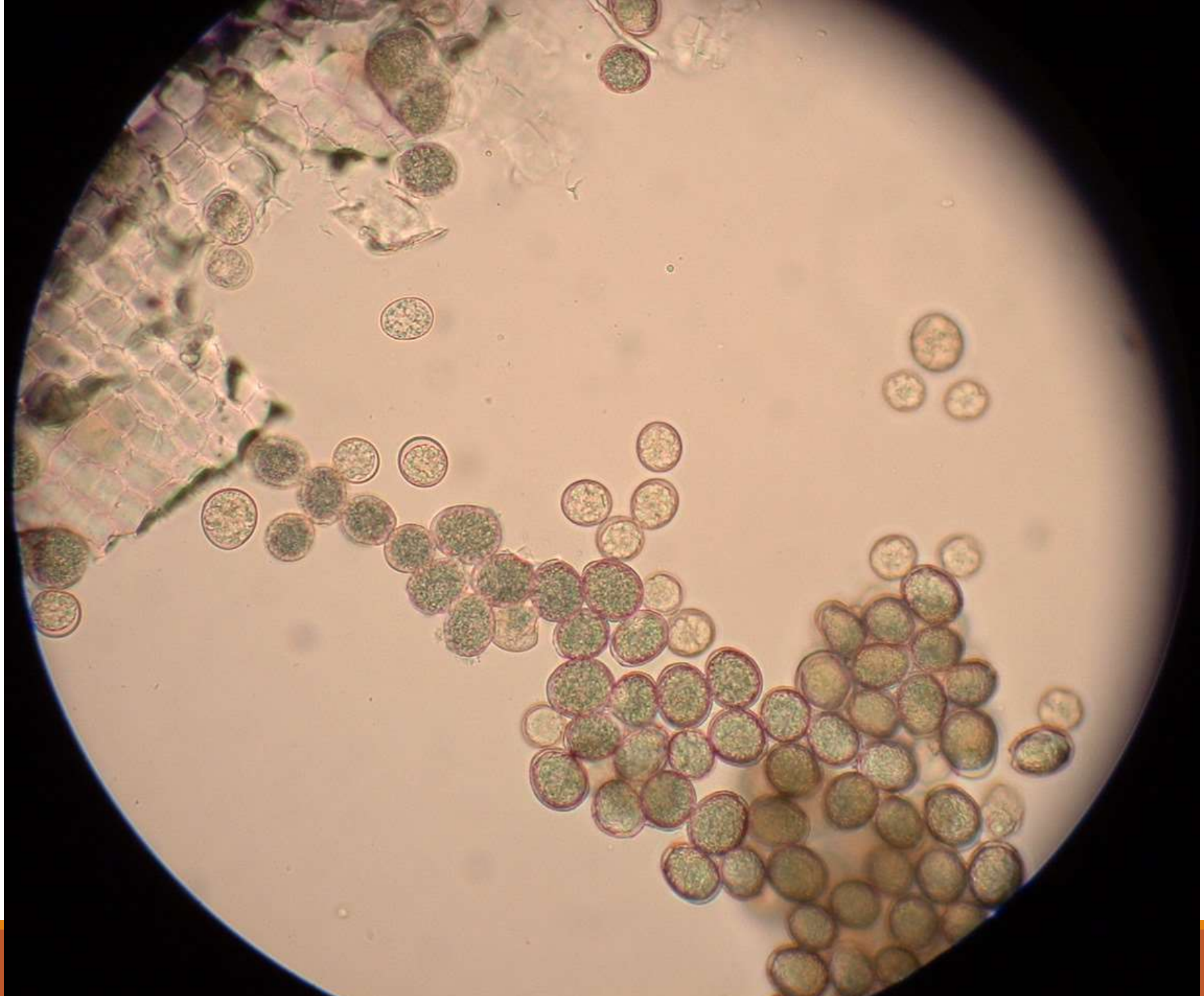
- Change substrate if applicable
- Clean/change perches

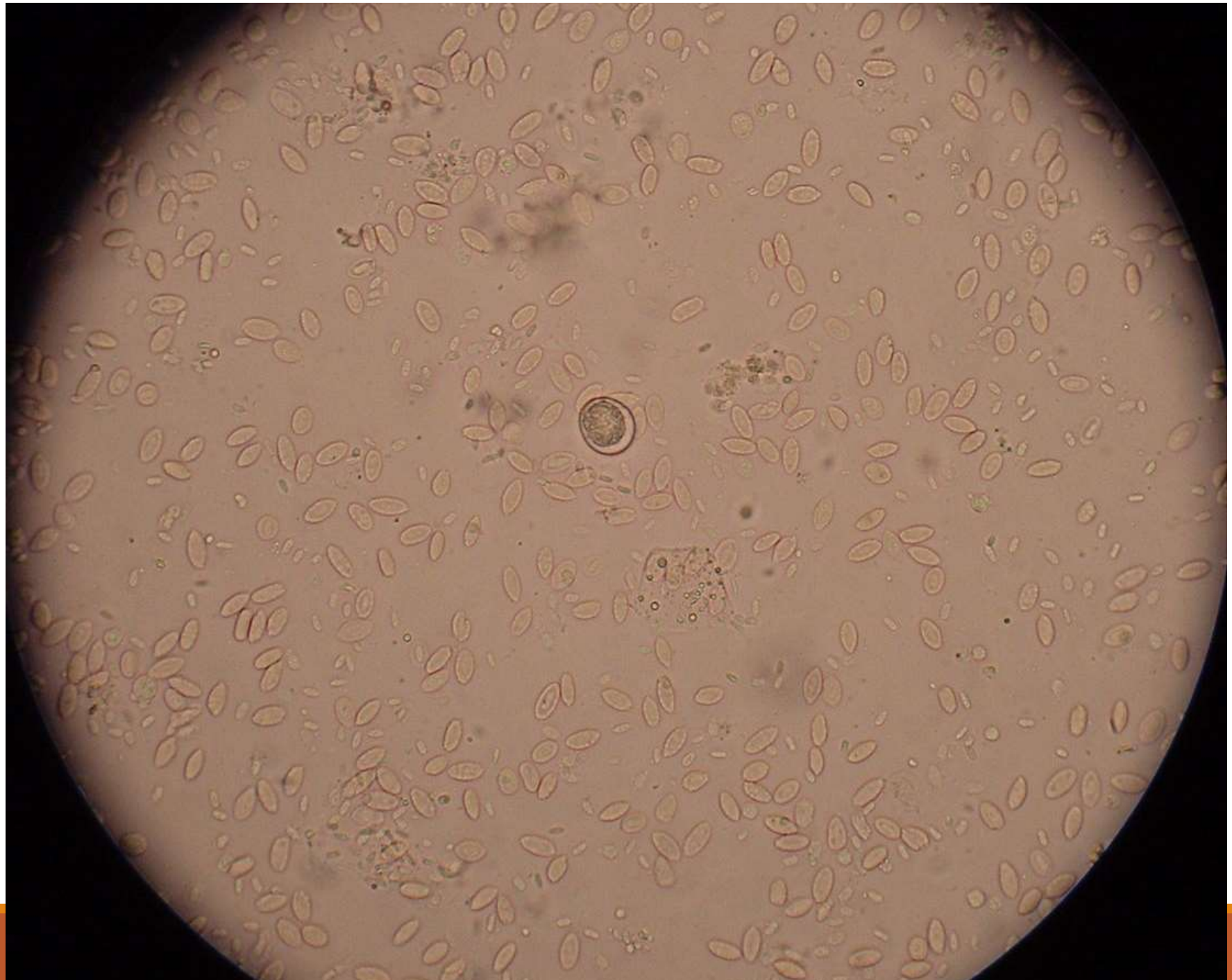
Fledgling Songbirds

Fledgling robins, blackbirds and mockingbirds

Distended abdomens

Tan diarrhea





Treatment/Prevention

Sulfadimethoxine

Toltrazuril (Baycox® or Coccicure®)

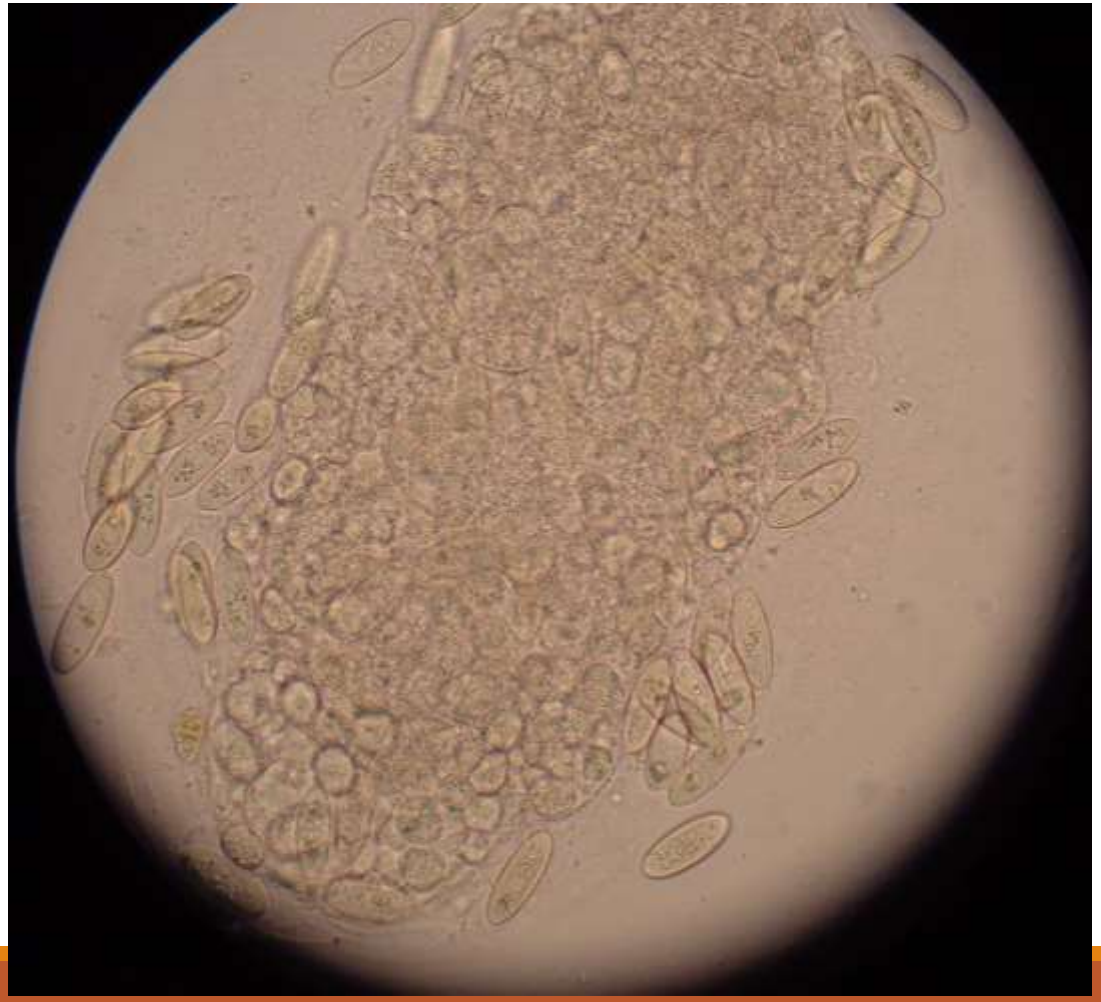
Clazuril (Appertex®)

Sulfamethazine bisulfate (Sulmet®)

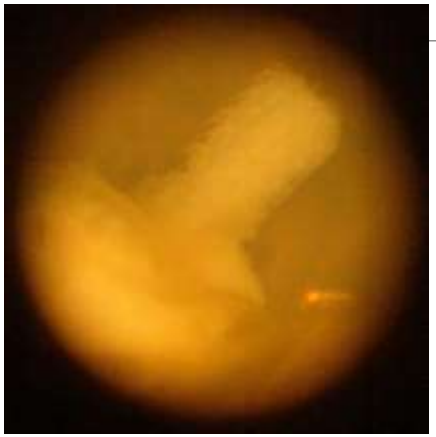
Amprolium (Corid®)

Change enclosure substrate

Repeat fecal 1 wk later

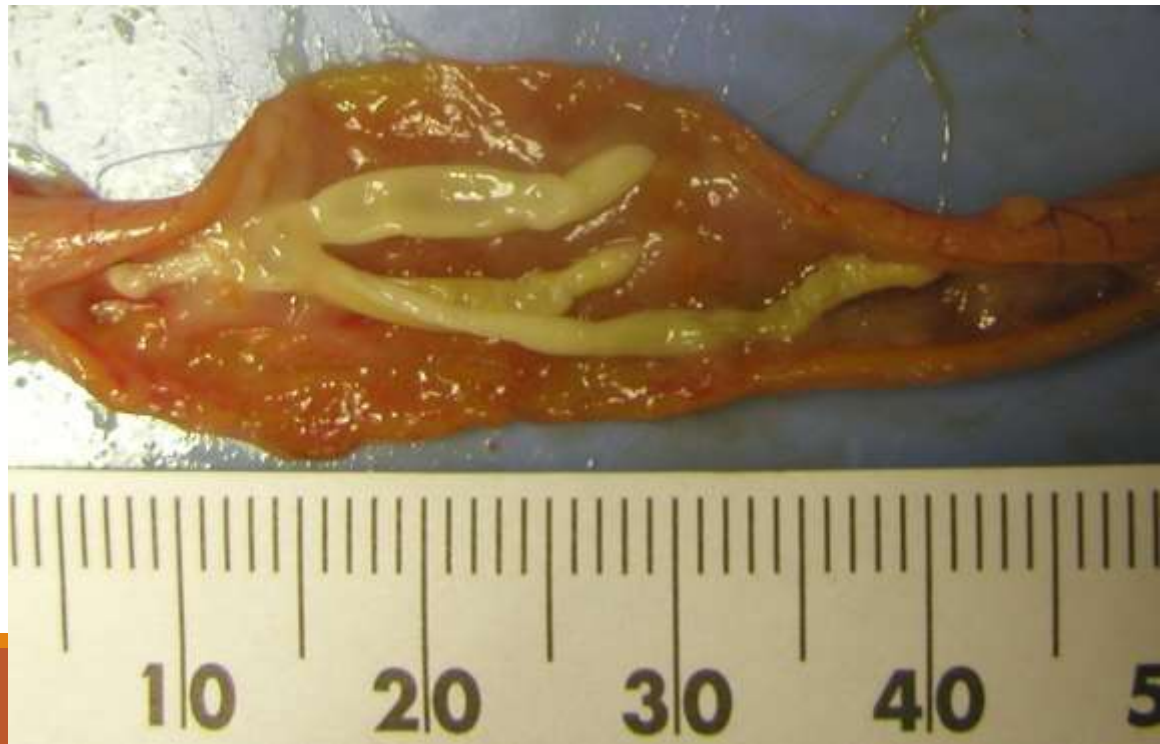


Acanthocephalans



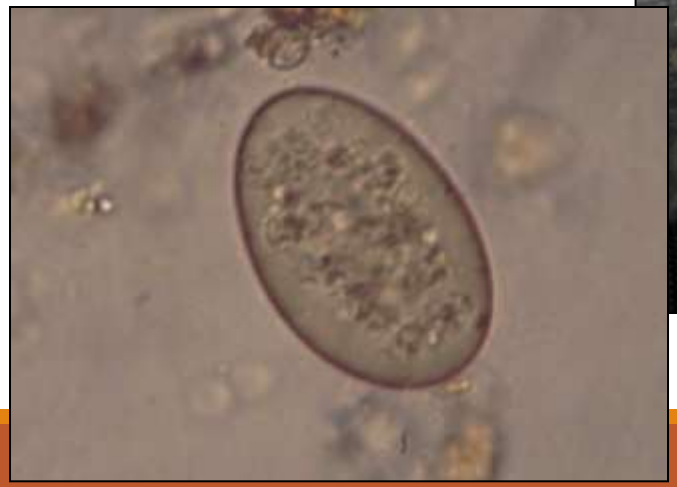
- Nutrient loss to the host
- Secondary infections
- No known effective treatment

Thiabendazole may work? Dithiazine 25mg/kg



Trematodes (Flukes)

- Operculated ova
- Often in snail- or fish-eating birds
- Complex life-cycles



Chuck Will's Widow

Adult

Holding right eye shut

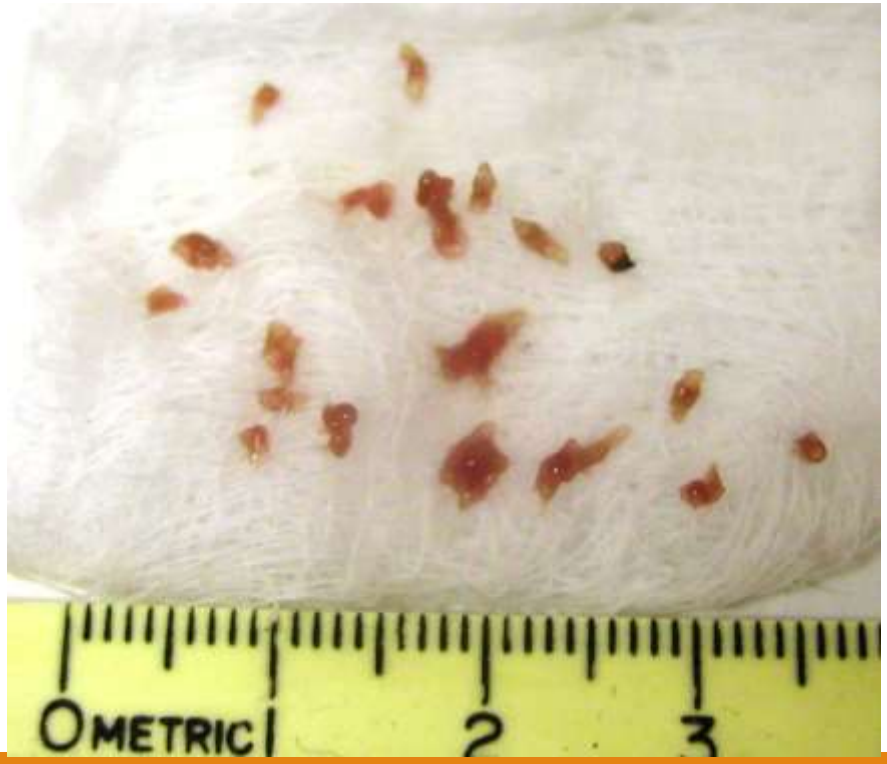
Ocular discharge (clear, crusty) both eyes

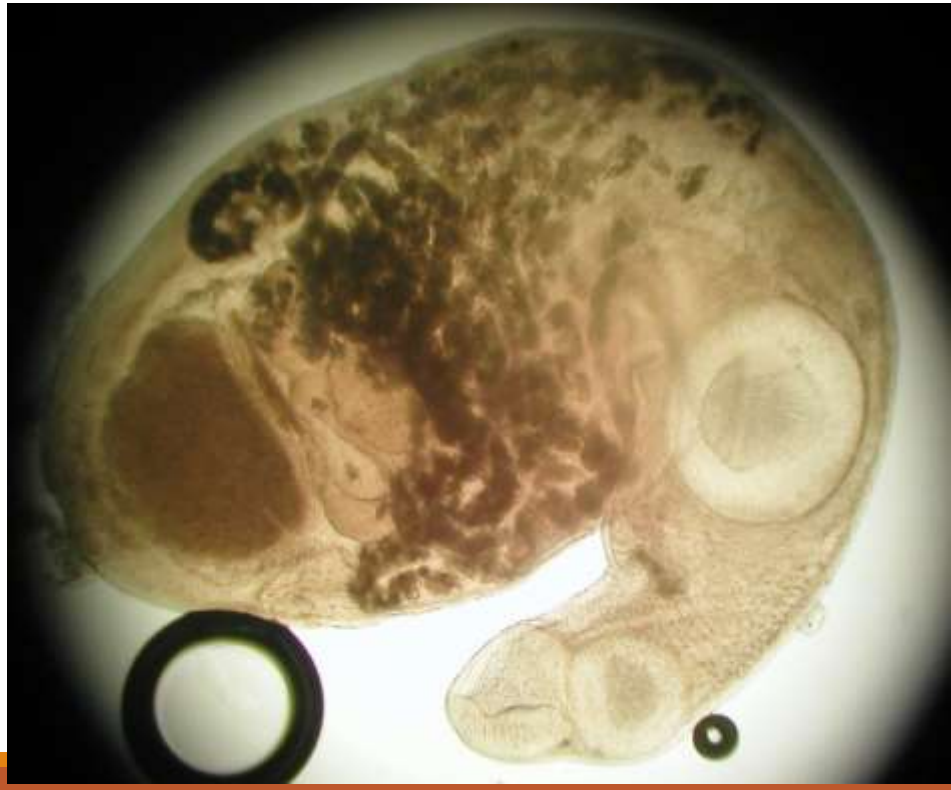
No improvement with topical antibiotics and anti-inflammatories

Chuck Will's Widow

Diplostomum sp.

--may migrate to the conjunctiva



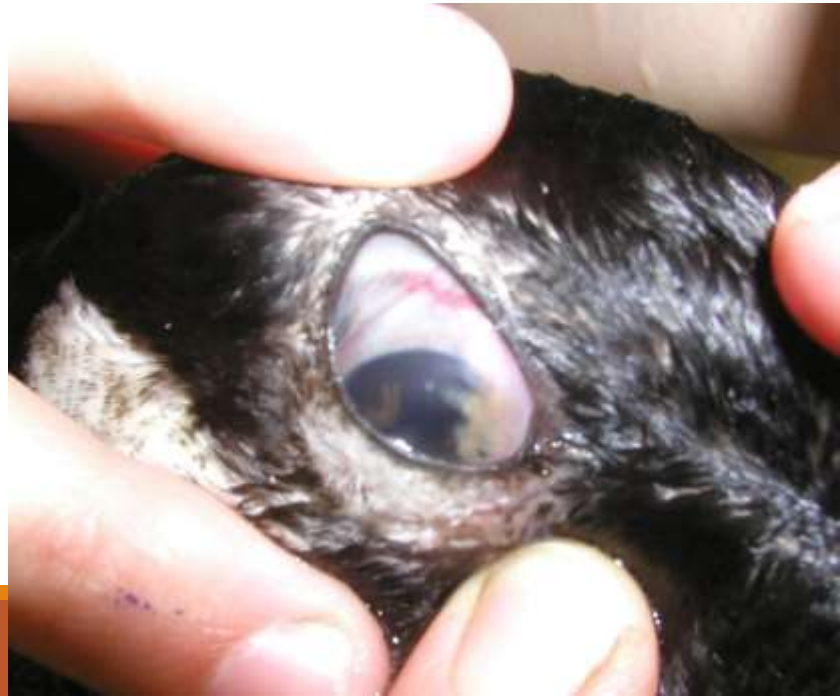


Treatment

Tetracaine Ophthalmic drops

Physical removal with forceps

One dose of Praziquantal (Droncit®)?



Pre-fledgling AMROs

Nest full of AMROs

Sneezing sounds

What do you do?

Gapeworm

- Red worms seen in trachea

Photo courtesy of John A. Frink

Gapeworm

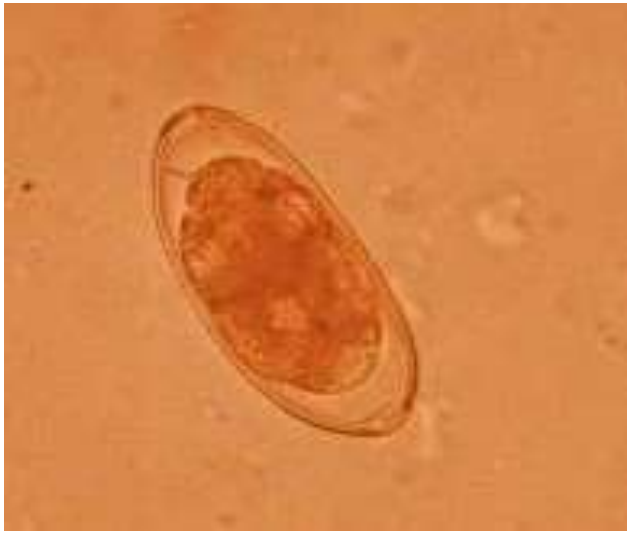
Cyathostoma sp.

Tracheal worm of upland gamebirds, raptors and many fish-eating birds

Appears similar to *Syngamus trachea*

Gapeworm

Slightly bipolar eggs seen in microscopic exam of feces



Canada Geese

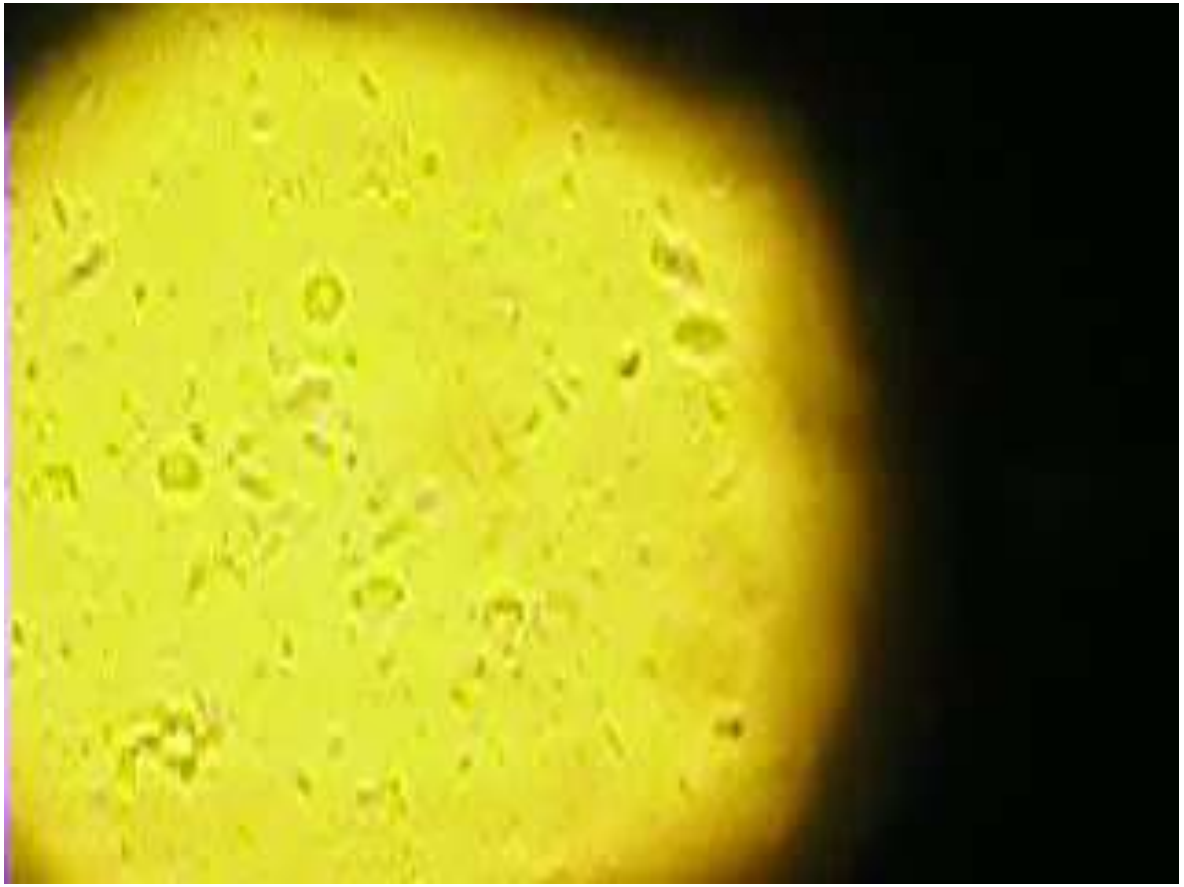
In outdoor flight enclosure

Watery diarrhea

Distinct odor

Best way to diagnose?

Direct smear



Treatment

Metronidazole (Flagyl®)

Wash hands after contact with droppings

Dilute bleach (1:32) kills organisms

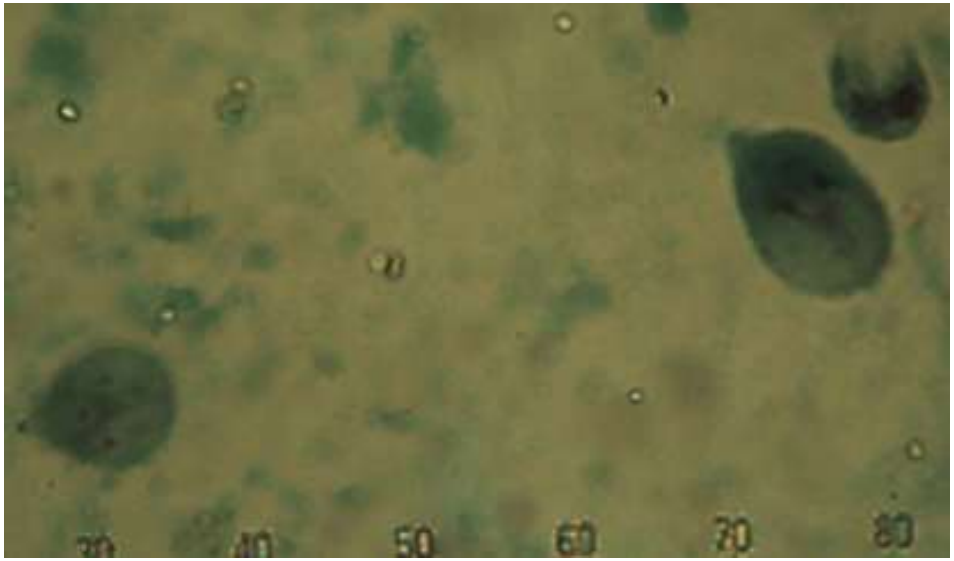


Photo courtesy of Michele Goodman

Questions?

Thank you

Toxins and Wild Birds

What kinds?

What species?

How do you diagnose it?

Photo credit: Jace Stansbury

Cholinesterase Inhibitors

Organophosphates

- From phosphoric acid
- Diazinon, Malathion
- Degrade rapidly by hydrolysis on exposure to light, air and soil

Carbamates

- From carbamic acid (NH_2COOH)
- Carbaryl (Sevin™), Carbofuran, Methomyl
- Degrade slowly in the environment (wks to mos)

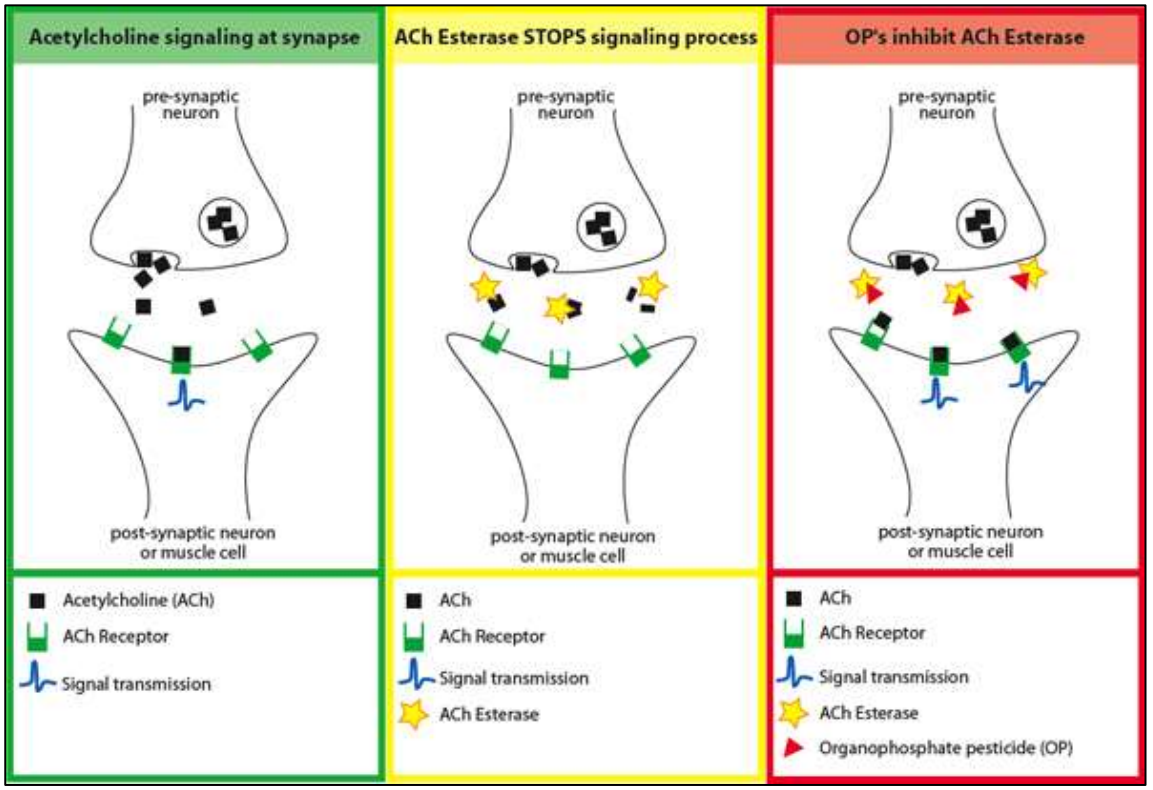
Goel & Aggarwal, 2007

Cholinesterase Inhibitors

Inhibit AChE

ACh continues to stimulate nerve transmission

Nicotinic & Muscarinic



http://depts.washington.edu/opchild/images/ach.jpg

Cholinesterase Inhibitors

Clinical signs

- Ataxia
- Salivation
- Muscular twitching
- Tachypnea
- Bradycardia
- Dilated pupils
- Convulsions
- Rigid paralysis

What else does this look like?

Clinical signs

- Ataxia
- Salivation
- Muscular twitching
- Tachypnea
- Bradycardia
- Dilated pupils
- Convulsions
- Rigid paralysis

Cholinesterase Inhibitors

Clinical signs

- Ataxia
- Salivation
- Muscular twitching
- Tachypnea
- Bradycardia
- Dilated pupils
- Convulsions
- Rigid paralysis
  - Clenched talons

Cholinesterase Inhibitors

Treatment

Initiate at clinical signs, esp. with history

Atropine 0.5mg/kg

- ¼ IV and ¾ IM

Diazepam or Midazolam

Activated charcoal

PO or SQ or IV fluids

Neonicotinoids

Synthetic nicotine
- e.g., Imidacloprid, Nitenpyram

Most widely used insecticides

Persistent & water soluble

Same nerve receptors as ChE I's

No antidote

Very few labs test for it

How do we distinguish it from OPs/Carbamates?

Photo credit: Janet Thomson/CBC

Case: Neonics in RWBB in NJ

- Nov 2016, approx. 200 blackbirds
- Farm field
- Treated wheat seed
- Seeds in gizzards

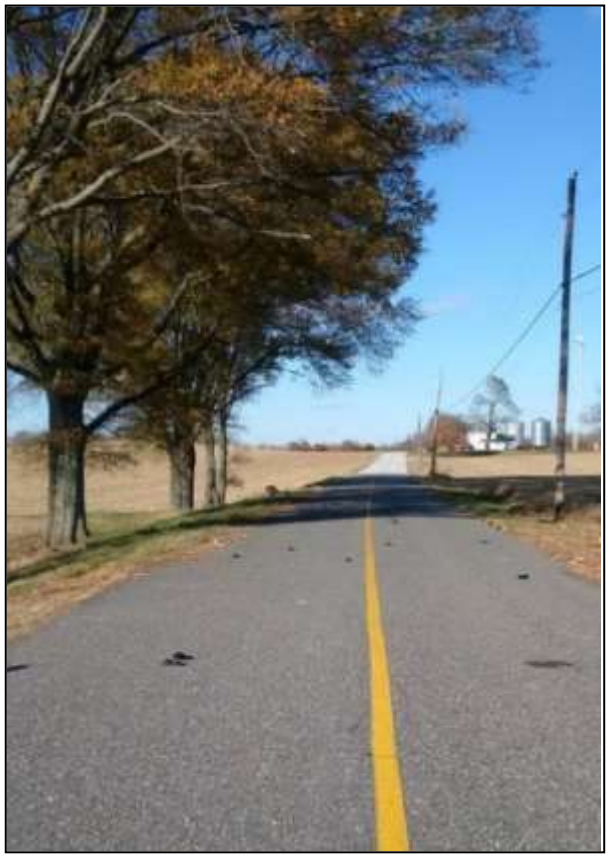


Photo credit: Sue Luchese, NJ DOA

Anticoagulant Rodenticides

1st generation

Warfarin, Pindone

- Multiple feedings
- Less toxic

2nd generation

Brodifacoum, Diphacinone

- “One feeding”
- Persists in tissues

Anticoagulant Rodenticides

Signs bruising, internal hemorrhages, profuse bleeding

Dx failure to clot; response to vit K1

Tx vitamin K1, supportive care and minimal handling; prevent additional absorption

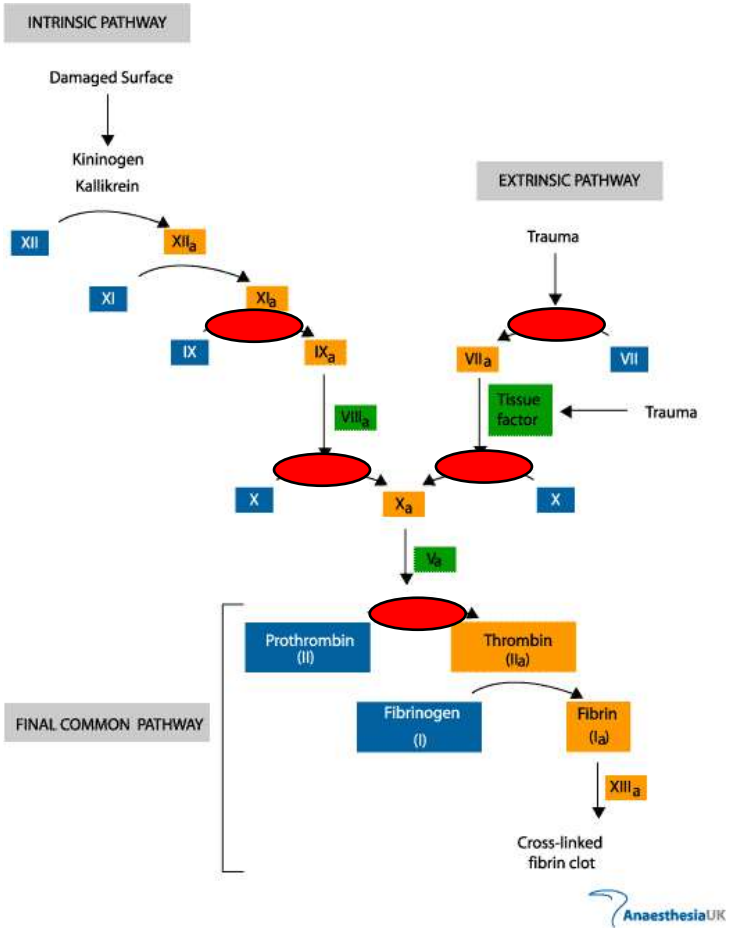


Image Source: www.frca.co.uk/

Anticoagulant Rodenticides

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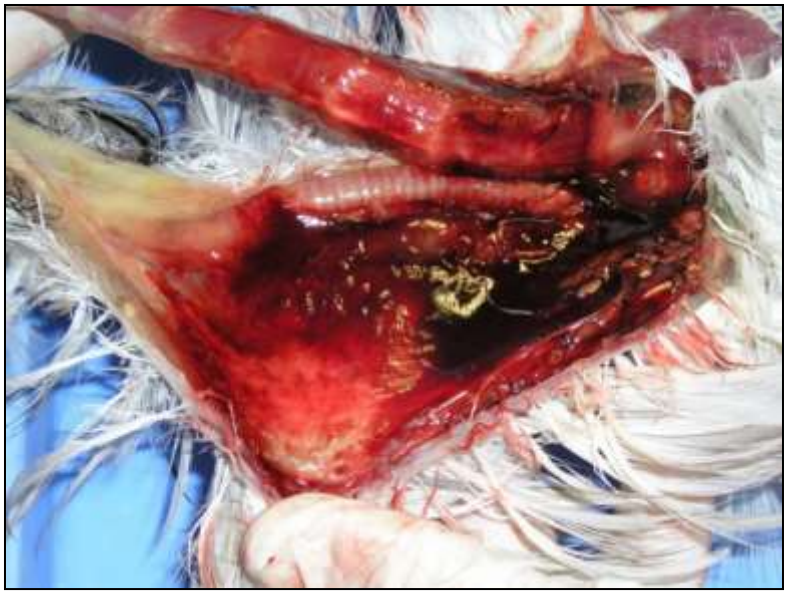


Avitrol®—Avicide

4-Aminopyridine

Control large flocks of starlings & pigeons

Distress 15 min after ingestion

May last 20 - 30 min

Ingestion to death = 3-50 h

Avitrol—Avicide

Increases ACh release

Clinical signs

- Disorientation
- Ataxia
- Distress calls
- Erratic flight
- Torticollis
- Tremors & Convulsions
- Death

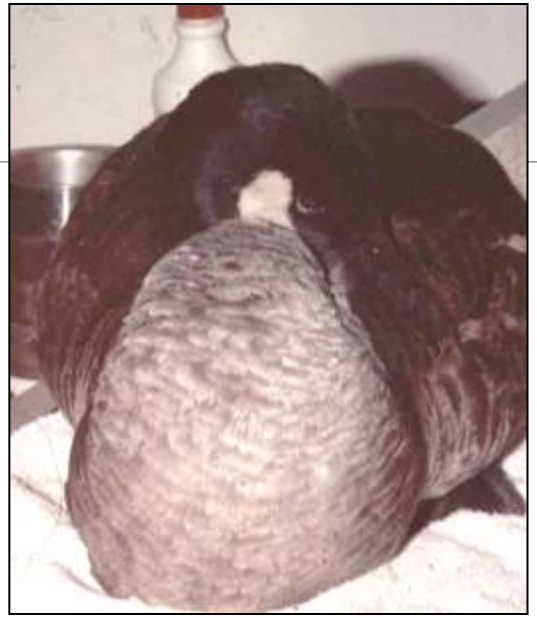
Tx Xylazine? Supportive care

Lead Poisoning

Plumbism

Ingestion of lead; absorbed from GIT and stored in tissues

CNS, ataxia, wing droop, diarrhea, crop impaction, “voice change”



Lead Poisoning

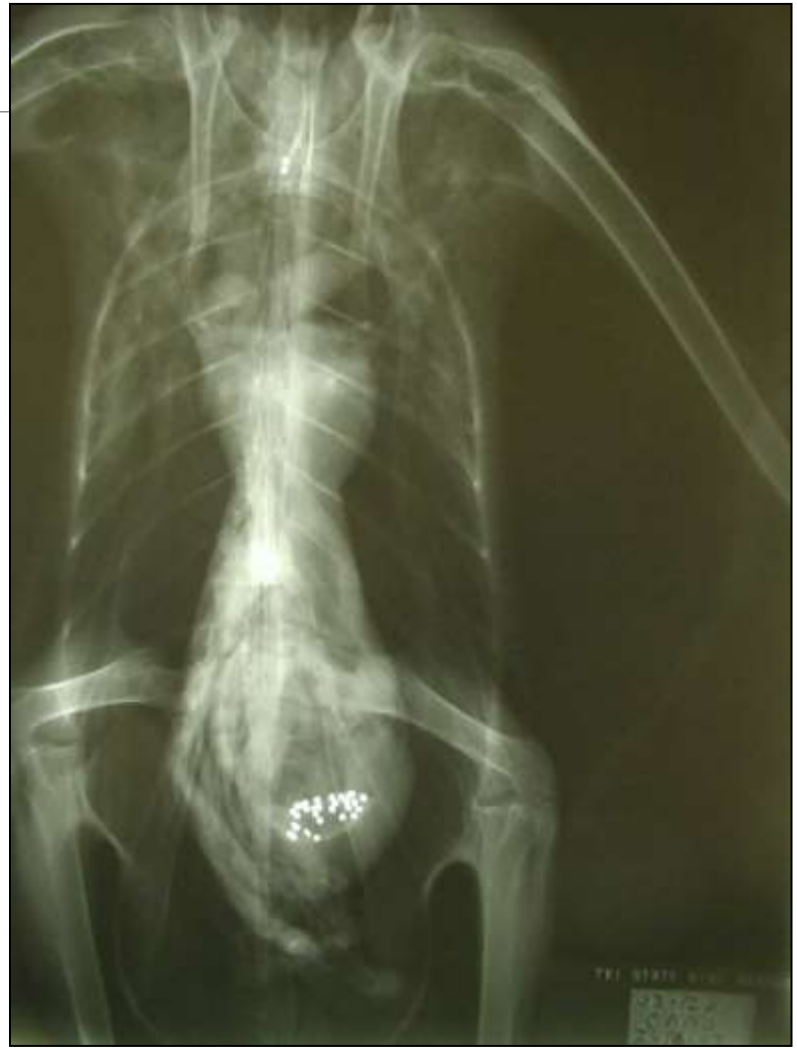
Dx Clinical signs

- Radiographs
- Blood lead level

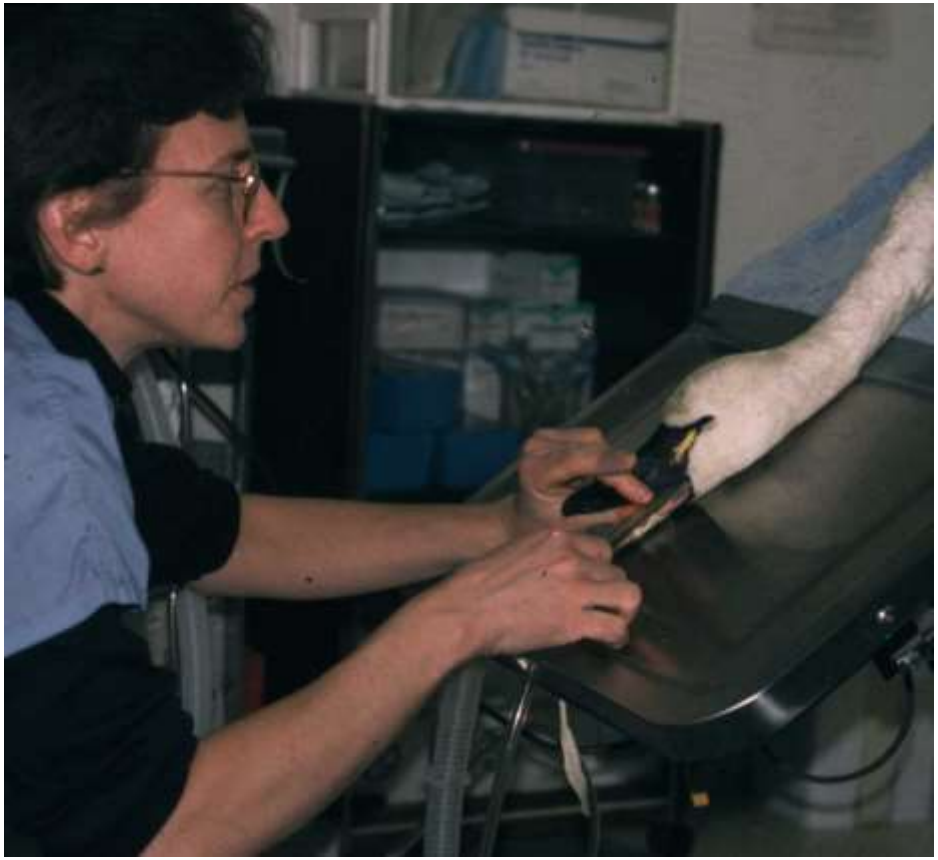
Tx Chelation

- DMSA (oral)
- CaEDTA (IV or SQ)
  - Zn supplement after

- Lavage



Gastric Lavage

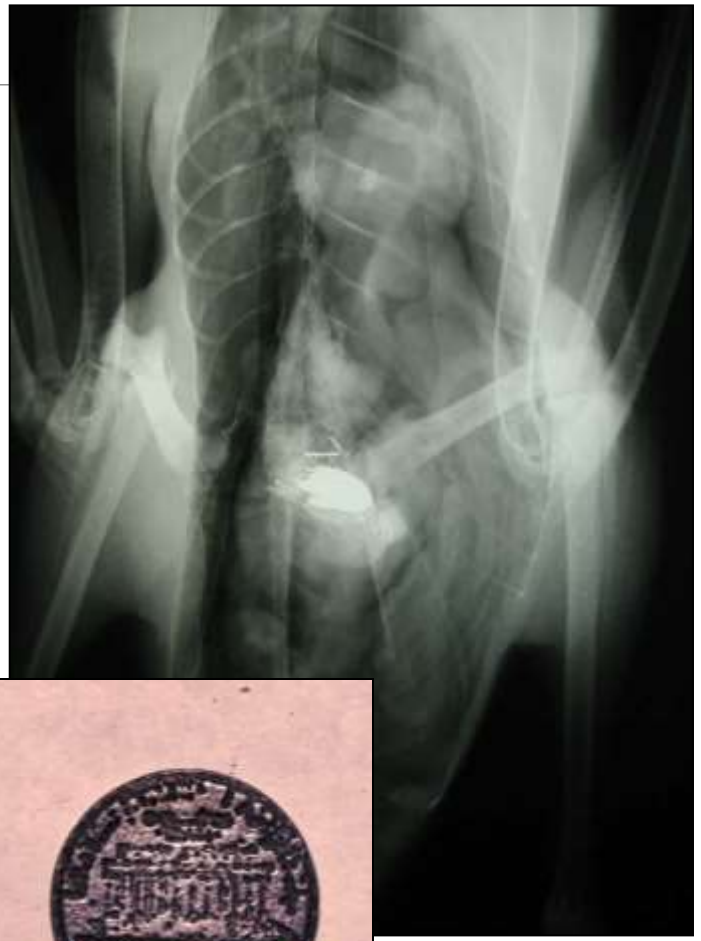


Followed by chelation therapy and supportive care

Zinc

Similar to lead toxicity
- Ataxic
- Neurologic
- Emaciated
- Dehydrated

Not stored in tissues



Botulism

- The pre-formed toxin of *Clostridium botulinum*
- Produced under certain environmental conditions
- Ingested, carried by lymph to PNS & blocks release of ACh
- Paralysis of striated muscles

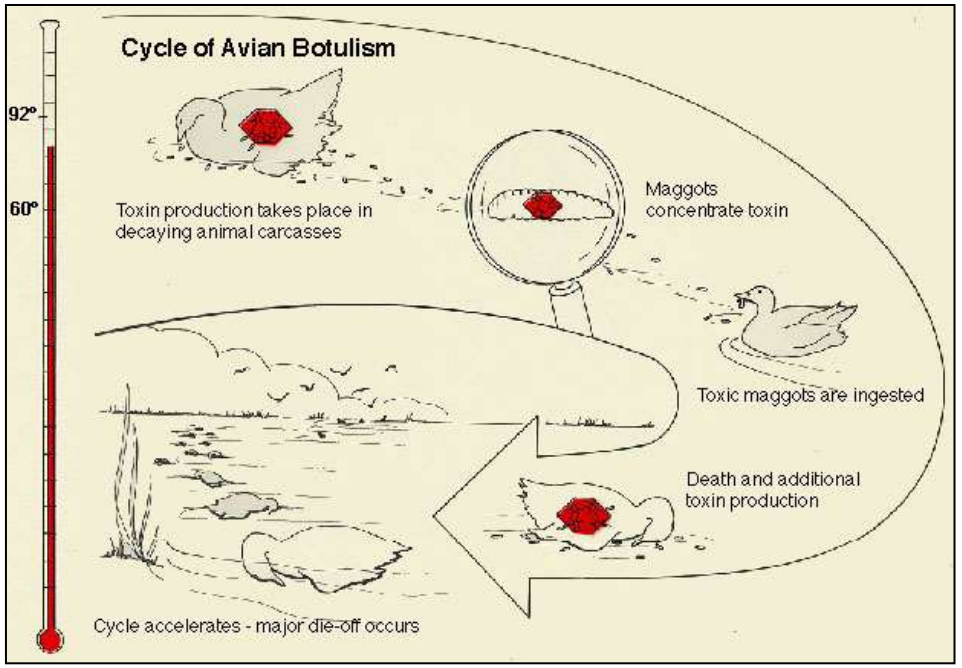
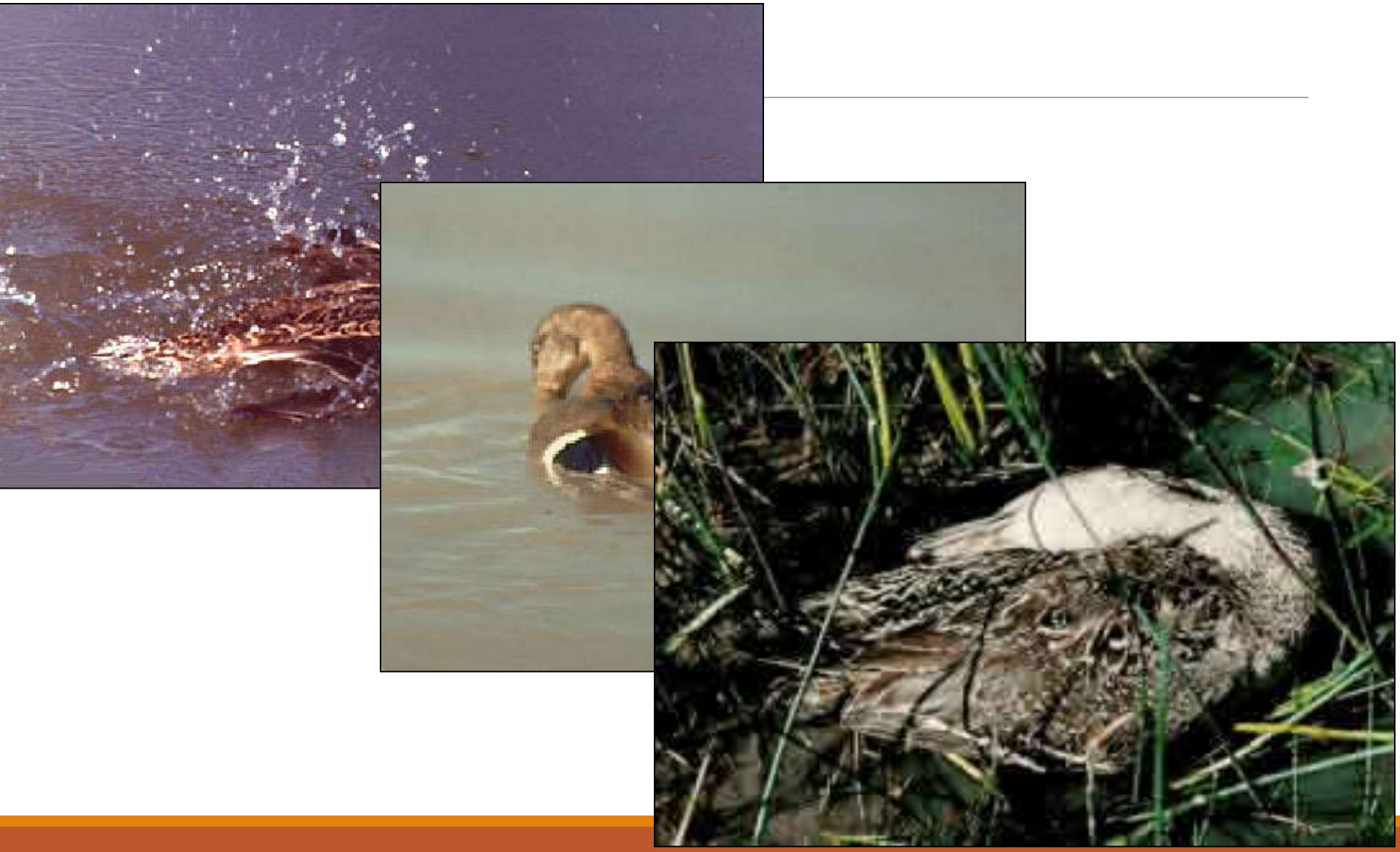


Image: USGS Field Manual of Wildlife Diseases

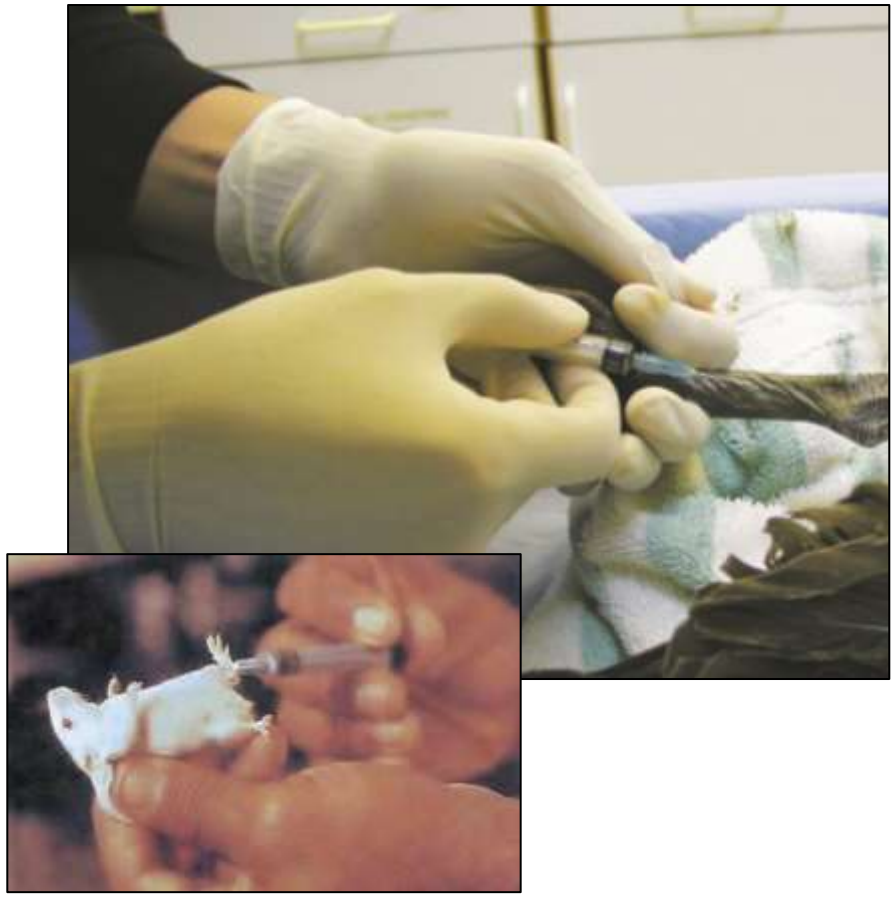
Botulism progression



Images: USGS Field Manual of Wildlife Diseases

Botulism diagnosis

- Clinical signs
- Time of year
- Location found
- Verify w/serum
  - Mouse inoculation
- No specific signs on necropsy



http://clostridium-botulinum.wikispaces.com/

Botulism

Treatment

- Removal of carcasses
- Flush eyes, lubricate with ophthalmic ointment
- Gavage with oral fluids every 2 hours
- Minimize handling & noise
- Botulism anti-toxin

Image: USGS Field Manual of Wildlife Diseases