Contagious Diseases
Prevention -Treatment - Control

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Basic Hygiene

- Disease is easily spread between patients
  - Wear disposable gloves
  - Wash hands with disinfectant soap
  - Disinfect countertops and workspaces
  - Dispose of contaminated bedding, boxes, etc.
  - Disinfect carriers, cages and feed bowls daily
  - Disinfect feeding and gavage tubes
  - Separate sets of clothing

Basic Hygiene

- Environments must be kept clean
  - Be sure cages and bedding are easily disinfected
  - Change out twigs, branches and other cage furniture
    - Disinfect perches
  - Do not allow feces and urine/urates to sit
- Provide adequate ventilation
  - Be sure sick or quarantined animals have either separate ventilation or if not feasible no return air duct
- Provide adequate nutrition
  - Key for proper recovery from any injury or captive situation

Husbandry is Key to Prevention

- Quarantine
  - Place incoming animals in separate room on intake
  - Keep new animals from hospital in-patients if only in separate cage
  - Keep animals with overt symptoms of illness as far from others as possible
  - Euthanize really sick animals before they come into contact with hospital in-patients
  - Be able to identify signs of illness
  - Most contagions are spread by direct contact with infected animal or by fomites

Common Contagious Diseases of Concern

- Viral
  - Pox
  - Rabies
  - Distemper
  - WNV
    - EEE & WEE
- Bacterial organisms
  - Mycoplasma
    - Finches, tortoises
  - Salmonella
  - Chlamydia
  - Pasteurella
    - Cat bite wounds
  - URI

Common Contagious Diseases of Concern

- Fungal
  - Canker
    - Candida, Monilla
  - Aspergillosis

- Parasitic
  - Canker
    - Trichamonas
  - Coccidia
  - Giardia
  - Baylisascaris Procyonis and other parasites
    - Knemodecoptes, worms, mange

Common Contagious Diseases of Concern

VIRUSES

Pox

- A virus that affects mammals, birds & reptiles
  - Typically are host specific
- Can occur in any age group
  - More common in juveniles
- There are 11 groups of vertebrate poxviruses
- Transmission occurs through direct or indirect contact with biting arthropods such as mosquitoes
- All the viruses cause generalized skin disease or localized skin tumors

Pox

- All the viruses cause generalized skin disease or localized skin tumors
  - With or without systemic involvement
    - Metastasis to the lungs, liver, kidney, and lymph nodes has been reported in squirrels
  - Tumors are typically nodular and can be proliferative, ulcerated, vesicular or crusty/bloody
    - Occur at site of insect bite
  - See most commonly on face, legs, extremities and sometimes on genital mucosa and body
    - Mucocutaneous junctions such as commissures of eyes and mouth and genital area

Pox

- "Dry" or cutaneous and "Wet" or mucosal form
- The viruses are very hardy in the environment
- Although the disease is self limiting infections can be life threatening
  - Lesions grow rapidly and disseminate over 1-2 weeks
  - Regression may not begin until 4-6 weeks
  - Lesions will resolve by sloughing, leaving a small discolored scar at the site, these animals are generally immune to further infection
- Secondary bacterial and fungal infections are common
- Lesions physically may cause anorexia, dyspnea, asphyxiation and blindness because of location
- If the disease is systemic, animals will be depressed, dyspneic and anorectic
  - most will die in 2-3 days

Falcon Pox

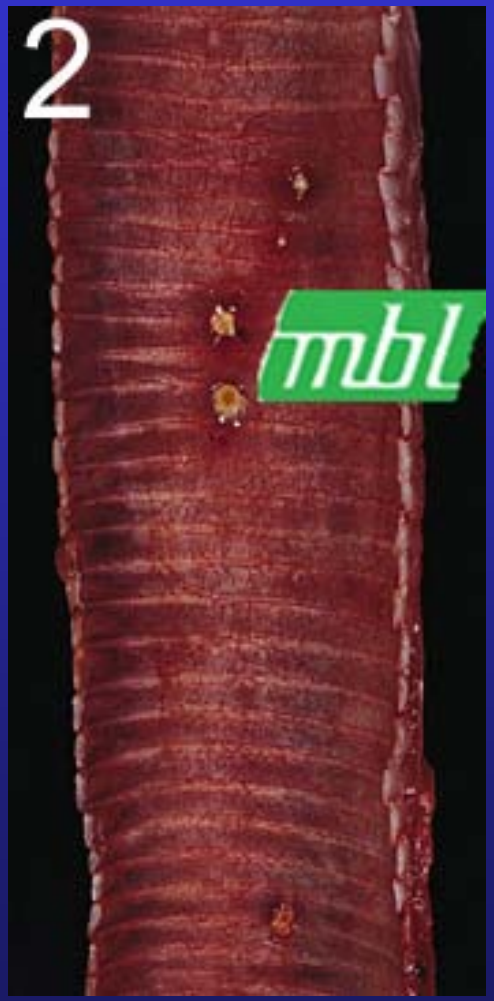
Finch Pox

Pigeon Pox

Eagle Pox

Squirrel Pox

“Wet” Pox



Pox

- Treatment – supportive care
  - Treat secondary infections
  - Lesions can be curetted and cauterized
    - May help reduce shedding of the virus
- Euthanize if severe or systemic
- Isolate animals that are clinically normal aside from lesions
  - Eating, normal activity level, etc.

Pox

- Vaccines are available for certain types of poxviruses, but does not speed regression
  - Only available for some species
  - Not widely used in raptors, although several commercially available pox vaccines cross-react with falcon pox virus
  - Requires booster 3-5 weeks after initial vaccination
  - Will not be protective unless high titers are reached
- Once recovered animals are considered immune to further pox infections
- Isolation of affected animals is best prevention
- Transmission occurs through direct or indirect contact with biting arthropods such as mosquitoes
  - Virus can live in salivary glands for several weeks
- Traumatic wounds to the feet are important in transmission because the virus is incapable of penetrating intact epithelium

Rabies

- Rabies (from Latin rabere-to rage)
  - One of the oldest recorded infectious diseases
    - Dating back to Mesopotamia and ancient Greek & Roman times
      - Recognized wildlife in transmission cycle
- Rhabdoviridae family
  - *Lyssavirus* genus
    - 7 antigenically distinct neurotropic viruses with different reservoir hosts
    - Classical rabies virus is *Lyssavirus* serotype/genotype 1

Rabies

- Acute infectious disease of the central nervous system
  - Acute encephalomyelitis
- Persists in nature as a salivary gland infection of carnivorous animals
- Transmitted from animal to animal and from animal to humans by a bite (exposure)
  - Less common infection routes are a contaminated scratch or wound, mucous membrane exposure, aerosol or laboratory accident
  - Rarely transmitted by ingestion or vertical transmission
- All warm-blooded animals are susceptible
- Once signs of illness appear, rabies is 100% fatal
  - Proper post-exposure treatment is nearly 100% effective in people
    - Annually tens of thousands of people die from rabies worldwide

Rabies

- Found in every continent except Australia & Antarctica
  - Most countries free of the disease are islands
    - Australia described a *Lyssavirus* in a black flying fox in 1996
      - Australian bat virus (not classical rabies)
- Reported in all US states except Hawaii
- Until 1960, dogs were the most important animal host of rabies in the United States
- After the institution of mandatory rabies vaccinations for dogs, wildlife species have been the most frequently infected animals with rabies
  - Domestic dogs and other terrestrial carnivores, New World insectivorous, hematophagous or frugiverous bat species

Rabies

- “The atypical is typical"
  - Describes rabies symptomatically in any species of animal
- Furious rabies
  - Exhibit aggressive signs early in the disease and then become paralyzed
  - Usually have an excitation phase lasting several days
  - The animal is restless and soon becomes vicious, biting at anything and everything
  - This action gradually subsides; incoordination and tremors are often apparent
  - Convulsions, paralysis and prostration occur just prior to death
- Those with dumb rabies simply become paralyzed and die shortly thereafter

Rabies

- No sign (or series of signs) is typical or characteristic
- Signs of other diseases such as distemper, hepatitis, listeriosis, tetanus, botulism and some parasitic diseases are similar to those of rabies
- Encephalitic syndromes can also be caused by plant or chemical toxins
- Clinical signs are so varied and overlapping that limited confidence should be placed on a clinical diagnosis of rabies
- The only sure way to diagnose rabies is with laboratory tests
  - There are no specific hematological or biochemical changes

Rabies

- Clinical signs besides aggressive biting behavior
  - Pruritis
  - Hyperexcitability
  - Hyperesthesia
  - Ataxia
  - Seizures
  - Behavioral changes
    - Loss of fear
    - Photophobia
    - Hypersalivation
    - Dysphagia
    - Change in phonation
    - Mydriasis
      - Only humans develop hydrophobia
- Pharyngeal paralysis and excessive salivation are common signs
  - Mistaken for pharyngeal foreign body and lead to human exposure by oral examination

Rabies

- Incubation time varies
  - Usually weeks to months
  - In extreme cases can be months to years
  - Depends on host, site of inoculation, viral dose and strain
  - In general, inoculation closer to the head results in a shorter incubation period
  - An animal can pass this infection to other animals or humans from 3 to 10 days before the onset of clinical signs (change of behavior, excitability, paralysis, followed by death) throughout the course of the infection.
- Dogs and cats are quarantined for 10 days for observation
  - If no illness becomes apparent within that time, they are considered not to have rabies
    - Clinical disease course is usually only days with animals developing clinical signs within several to 10 days of initial virus shed

Rabies

- Wild animals that have bitten or exposed humans or unvaccinated domestic animals should be immediately euthanized and their heads submitted to the proper health authorities as soon as possible
- Bats should be sent in whole
- Care must be taken when euthanizing such animals to avoid damaging the brain
- The individual handling dead animals or suspect animals should wear rubber gloves as a precautionary measure to avoid accidental exposure

Rabies

Rabies

- Be sure to consider the following possible post exposure
  - Circumstances surrounding exposure
    - Was animal provoked or unprovoked
    - Species involved
    - Animal health history/vaccination status of person or animal exposed
    - Rabies epidemiology in your area

Rabies

- Rabies is density-dependent
  - Cycles within species in epizootic-enzootic cycles
  - Depends on population dynamics and demographics, natural history of reservoir host, species, habitat, viral variant, disease course and the proportion of immune and susceptible individuals
- Spillover to non-endemic hosts during epizootic
  - Increased proportion of susceptible individuals
  - Lagomorphs and rodents are rarely diagnosed with rabies
    - Most do not survive attack to develop the disease
    - Groundhogs are reported most frequently as they are large and live to develop the disease

Rabies

- No parenteral rabies vaccines are licensed for use in non-domestic species
- Wildlife vaccination in endemic areas is recommended only of known reservoir hosts
  - Start at 3 months of age with annual revaccination if possible
  - Avoid attenuated vaccines
    - Potential for vaccine-induced disease
- Limited post vaccination titer studies in non-domestic species
  - Cell culture origin vaccines have higher and more consistent virus-neutralizing antibody (VNA) titers (vs suckling mouse brain vaccines)
- Oral rabies vaccination must have state or federal rabies program authority
  - Has been used in 10 states for control of rabies in raccoon, foxes or coyotes
  - Attenuated vaccine or vaccine composed of vaccinia virus genetically modified to express rabies surface glycoproteins
  - Oral mucosa is exposed and results in a recombinant vaccinia virus infection and induction of rabies VNA
  - Infection in non targeted species is possible

Rabies

- Translocations of wildlife species for conservation, wildlife management, commercial purposes and collection of animals for pets, exhibition or laboratories has spread rabies
  - Animals incubating rabies have been moved infecting free-ranging populations or captive collections
    - Historical examples:
      - Dogs moved with humans colonizing new areas
      - Introduction of Indian mongoose for rat and snake control on many Caribbean islands
      - Foxes in British American colonies for hunting
    - 20th century examples:
      - Raccoons were moved from FL to TX
      - Gray foxes from TX to MT
      - Coyotes from TX to SE states
- Translocations of reservoir wildlife hosts should never be done from rabies enzootic areas
  - Only for sound ecological or conservation purposes
  - Only if demonstrated need for translocation justifies risk of disease potential

Distemper

- Virus affecting many carnivorous species
  - Fox, raccoon, coyote, skunk, seal, wolf, panther, bobcat, lynx, weasel, fisher otter, badger, skunk, wolverine, and other mustelidae
- K-9 and Feline strains
  - Both are highly infectious
  - In general canids are not susceptible to feline distemper
  - In general felids are not susceptible to canine distemper
    - Did jump species in africa when lions were infected with canine distemper
    - Phocid distemper virus in seals
  - Raccoons & Mustelids are susceptible to both viruses
  - Distinctly different viruses affecting different species
- Neither affect humans
- Both are spread when animals have direct contact with droppings or body fluids from an infected animal
- Definitive diagnosis of both is by laboratory analysis of affected tissues
  - Presumptive diagnosis can be made by clinical signs and necropsy findings

Distemper

Family	Canine Distemper	Feline Distemper
Canidae Wolf, coyote, fox, domestic dog	yes	no
Felidae Bobcat, lynx, panther, domestic cat	no	yes
Procyonidae Raccoon	yes	yes
Mustelidae Ferret, mink, weasel, martin, fisher, otter, badger, skunk, wolverine	yes	yes

Canine Distemper

- Paramyxovirus
- Mortality in juveniles is higher than in adults
  - Majority of cases are seen in spring & summer but disease is seen year round
- Transmission
  - Droplet-aerosol
  - Direct contact
  - Contact with contaminated objects
  - May be transmitted transplacentally
  - Virus shed in feces and urine
    - Typically inhaled, occasionally ingested
    - Virus replicates in tonsils and lymph nodes then enters blood stream and is transported to epithelial cells throughout the body

Canine Distemper

- Clinical Signs
  - May be confused with rabies
    - Apparent loss of fear & abnormal behavior may be only apparent signs
  - Purulent nasal and ocular discharge
    - Eyelids may be crusted together
  - Neurologic signs
    - Aggressiveness
    - Disorientation
    - Dull, non-responsive, not alert
    - Convulsive movements of the head and paws
    - Aimless wandering
  - Unkempt coat
  - Hyperkeratosis of nasal planum & foot pads
  - May see diarrhea (see more with feline distemper)
    - Dehydration, polydipsia, weakness & emaciation if the disease is more advanced

Canine Distemper

- No treatment
- Supportive care
  - Not feasible with wildlife species
- Euthanize infected wildlife to prevent spread of disease
- Disinfect with Roccal R or bleach
  - Virus is also inactivated by heat and formalin
  - Incinerate infected carcasses or bury deep enough to ensure that scavengers will not uncover
- Young animals that survive infection may have a ridge in their teeth with or without discoloration

Feline Distemper

- Parvovirus
- a.k.a. Feline Panleukopenia, cat plague, cat fever, feline agranulocytosis and feline infectious enteritis
- Mortality in juveniles is higher than in adults
- Shed in all body secretions and excretions of infected animals
- Recovered animals may shed virus for months
- Fleas, flies and other insects may be a mechanical vector of the disease
- Stays in the environment for a year
  - Fomites can spread disease
  - Bleach will adequately disinfect
    - Canine parvo stays in the environment for 6 months

Feline Distemper

- Transmission is commonly by inhalation or ingestion of infective material
- Feline distemper affects all rapidly dividing cells
  - Intestinal mucosa, bone marrow, reticulo-endothelial system
- Some animals will die peracutely before gross signs are seen
  - May only have a high fever on exam

Feline Distemper

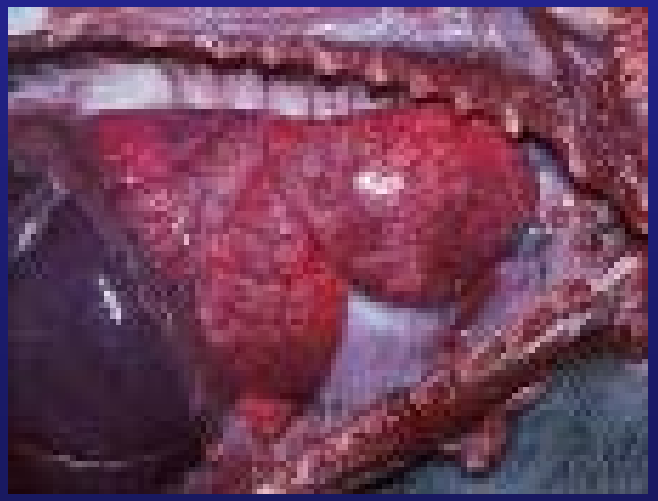
- Clinical signs
  - Depression
  - Vomiting
  - Diarrhea
    - Sometimes the only way to distinguish between canine and feline infections in raccoons
  - Profound leukopenia

  or
  - Encephalytic syndrome
    - CNS disturbances
    - Convulsions
    - Ataxia

Feline Distemper

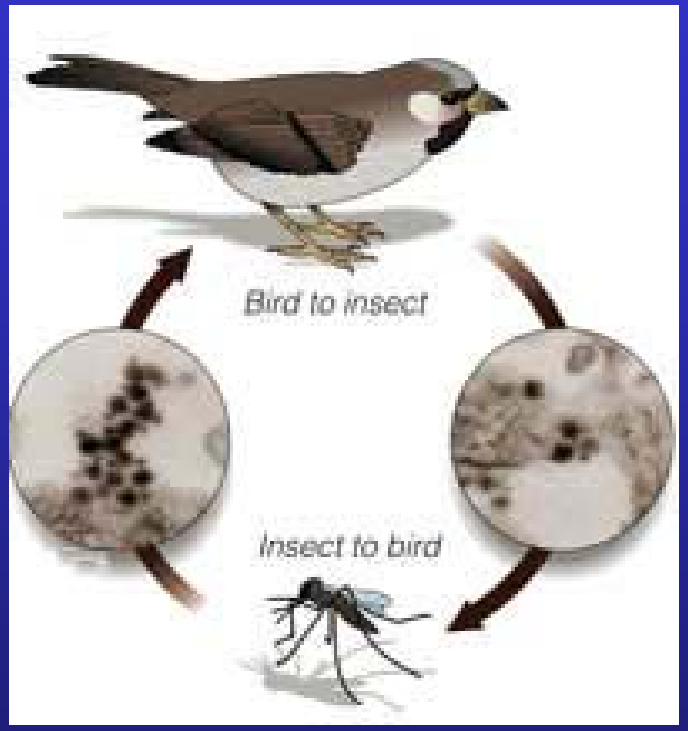
- Mortality is high in all age groups
- Course of the disease is short and rarely lasts more than one week
- No treatment
- Supportive care
  - Not feasible with wildlife species
- Euthanize infected wildlife to prevent spread of disease
- Disinfect with Roccal R or bleach

Distemper



West Nile Virus

- Emerging disease
  - Not documented in Western Hemisphere prior to 1999
- Highly publicized
- Mosquitoes contract West Nile Virus when they feed on infected birds
- Infected blood circulates within a mosquito's salivary glands for a few days
- Virus incubation is three to fourteen days following a bite by an infected mosquitoe
- Not everyone who contracts the virus will have a severe reaction
- Symptoms can be very mild ranging from a small fever and flu-like symptoms or it can result in permanent neurological affects or death



West Nile Virus

- West Nile virus can infect both humans and certain animals including horses, many types of birds and certain other mammals
- Over one hundred ten species of birds have been known to be infected
  - Mainly Corvid spp and birds of prey
- No evidence to suggest that WNV can be spread from person to person or from animal to person
- WNV has only been documented spreading by infected mosquitoes
  - Animals placed in cages next to infected animals have contracted the disease

West Nile Virus

- Three phases described (Dr. Pat Redig-The Raptor Center UMN CVM)
- Phase 1
  - Closing of one eye, weight loss, regurgitating of food and medicines, listlessness, depression, anorexia, weight loss (in proportion to duration of anorexia), sleeping, pinching off blood feathers
  - Elevated white cell count
- Phase 2
  - In addition to the above, head tremors, green urates (indicating liver necrosis), mental dullness/central blindness and general lack of awareness of surroundings, ataxia (clumsiness), weakness in legs
- Phase 3
  - More severe tremors, seizures & finally death.

West Nile Virus

- Mammals do not develop sufficient levels of viremia to serve as reservoirs
  - Infection may still result in severe and potentially fatal meningoencephalitis
- No treatment
- Supportive care
- Equine encephalitis vaccine has been used in some raptor species
  - 2 doses 3-4 wks apart
  - Unknown if it really works
- Best is prevention

West Nile Virus

- **Control Mosquitoes from Breeding**
  - Turn over or remove containers in your yard where rainwater collects
    - potted plant trays, buckets or toys
  - Empty birdbaths once a week
  - Remove old tires from your yard
  - Drain wading pools often
  - Clean roof gutters and downspout screens
  - Eliminate standing water on flat roofs
  - Do not allow water to collect in garbage cans

West Nile Virus

- Summit mosquito bits and dunks
  - Summit mosquito dunks

    7657 Canton Center Drive

    Baltimore, MD 21224
    - works for 30d. 1 dunk/100 sq ft
    - safe for pets, birds & other wildlife
    - 6 pack $9.29; 36 oz. $12.29; Lily w/2dunks $8.59
    - q-pet.com/store/Ponds/MosquitoControl.asp
- Mosquito netting
- Bring animals in at dusk
  - Especially education animals or perms where frequent moving is feasible
- Propane mosquito trapping device
  - Mosquito Magnet
  - Mosquito Deleto

Common Contagious Diseases of Concern

BACTERIAL

Mycoplasma

- Highly contagious bacteria
  - Lack a cell wall
  - Closely associate with cell membranes of host infecting
- See most commonly in finches and tortoises
  - Causes upper respiratory tract disease (URTD)
- Transmission
  - Direct contact
    - Ocular and nasal discharge
  - Air-borne respiratory droplets
  - Dust (dried fecal material)
  - Contaminated equipment
  - Eggs

Mycoplasma

- Organism does not survive outside of the body for significant length of time
- Hypovitaminosis A seems to predispose
- Most commonly spread in finches by ocular secretions
  - Tube style bird feeders
- Spread in tortoises by aerosol and nasal discharge
  - High population densities

Mycoplasma

- Clinical signs
  - Red, swollen eyelids and conjunctival tissue
  - Clear ocular discharge
  - Can progress to extreme swelling of the eyelid and conjunctiva, crust formation along the eyelid margins resulting in ulcerations on the cornea and purulent discharge and loss of sight
    - Birds may also display wet, matted feathers on the face (especially around the eyes) and fluffed body feathers
  - Inflammation of the sinuses
  - Discharge flowing from the nares
  - Inactivity
  - Weight loss
  - Anorexia
  - Death due to starvation, exposure or predation

Mycoplasma

Mycoplasma

- Some strains can cause systemic infection
  - Affect brain and joints

Mycoplasma

- Diagnosis requires specialized labs
  - Tortoises-serologic test can determine exposure
    - ELISA (Enzyme linked immunosorbent assay)
    - Measures specific antibody in plasma or serum
    - Mycoplasma Research Lab

      Dr. Mary Brown : 352-392-4700 x3970

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      University of Florida

      1600 SW Archer Road

      BSB 350

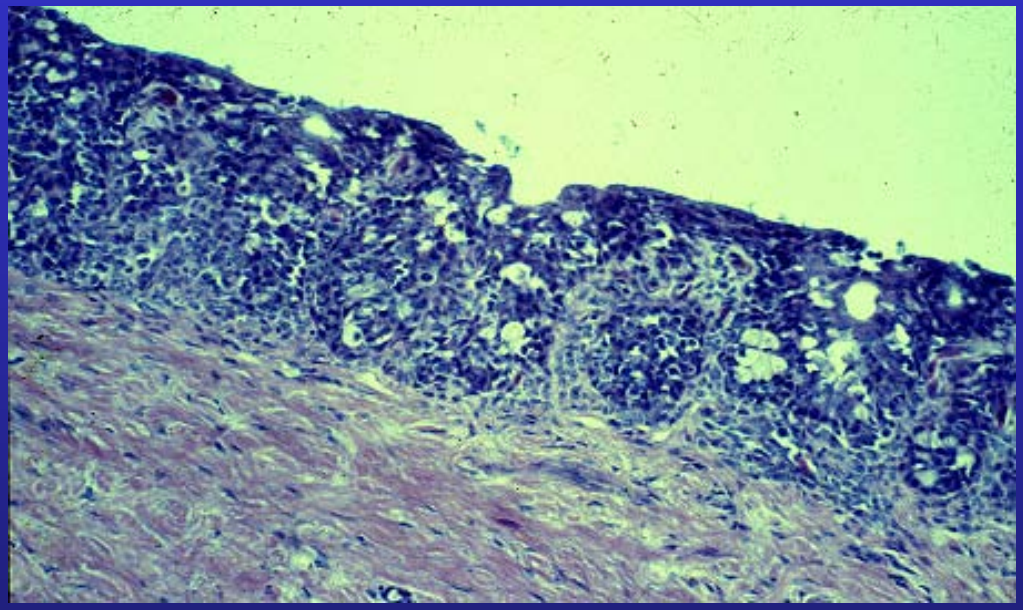
      Gainseville, FL 32610

Mycoplasma

- Diagnosis requires specialized labs
  - Birds are also diagnosed with ELISA
  - Need to check with lab to see if they run the test
  - Postmortem samples
    - Air sacs
    - Salpinx
    - Lungs
    - Spleen
  - Antemortem samples
    - Swabs of upper respiratory tract or phallus
    - Biopsies of affected air sacs

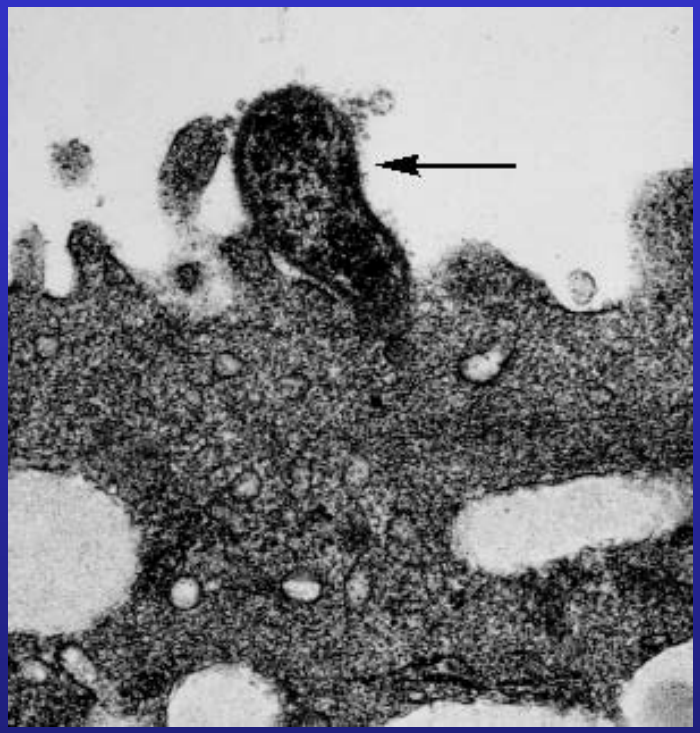
Mycoplasma

Photomicrograph of dorsal chamber of nasal cavity of normal tortoise

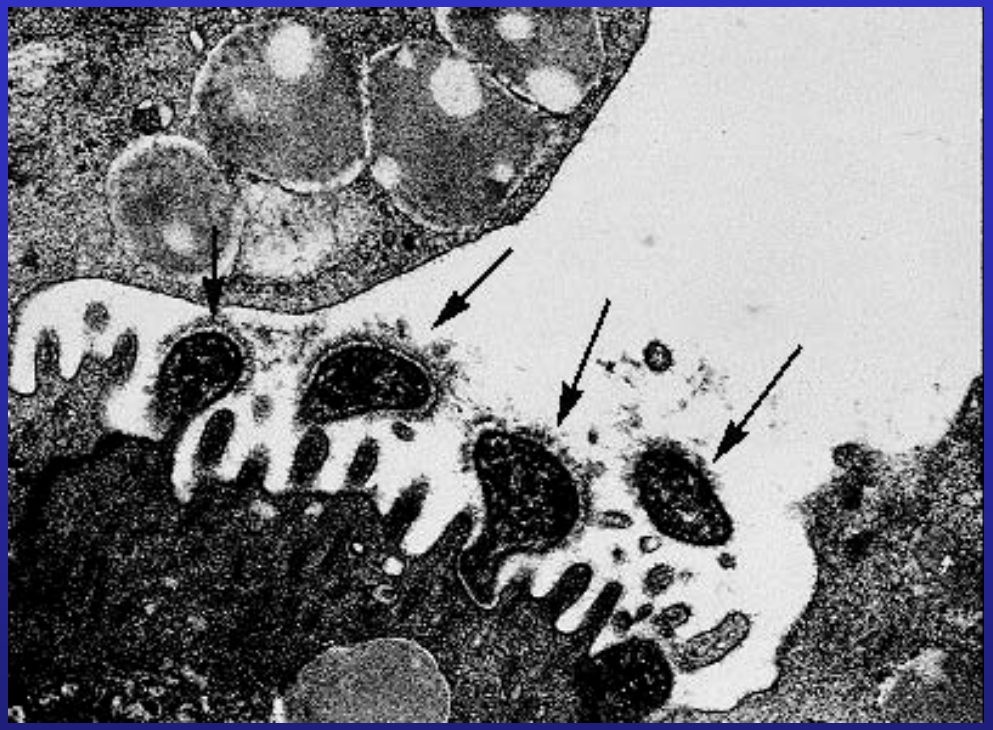


Photomicrograph of URTD tortoise epithelium is dysplastic with infiltrates of mixed inflammatory cells and basal cell hyperplasia

Mycoplasma



EM nasal cavity mucosa of gopher tortoise with mycoplasma. Arrow shows single mycoplasma organism closely associated w/ cell membrane



EM nasal cavity of tortoise arrows show mycoplasma organisms associated with cell membrane

Mycoplasma

- Treatment can be difficult because of its close relationship to host cell membranes
  - Inaccessible by therapeutics and host defense mechanisms
  - Penicillins and other cell wall active antibiotics
    - Ineffective due to lack of cell wall
    - May exacerbate disease
- Gear treatment to control of clinical signs and reduction of clinical lesions
- Cannot eradicate disease
  - Once infected animals will be carriers for life
    - Outbreaks during of times of stress are common

Mycoplasma

- Tortoises
  - Enrofloxacin
  - Tetracycline
  - Macrolides
    - Tylosin
    - Erythromycin
    - Tilmicosin

Mycoplasma

- Birds
  - Tylosin
  - Erythromycin
  - Tiamulin
  - Gentamicin
  - Tetracyclines
  - Streptomycin
  - Spiromycin
  - Lincomysin
  - Spectinomycin

Chlamydia

- Obligate intracellular bacteria
  - Dependent on host cell for energy needs
- Infective form is elementary body
  - Can exist outside the host
  - Shed by infected animals
- Reproductive form is reticulate body
- Infection occurs by aerosol and ingestion
- Incubation period is days to years
- Infects a wide range of vertebrate and invertebrate hosts
  - Reported most commonly in birds (all birds are susceptible)
  - Disease of emerging importance in reptiles & amphibians
- Zoonotic
  - Most human infections *C. psittaci*

Chlamydia

- Clinical disease is uncommon
  - High seroprevalence in wild birds
  - Ocular, genital and pulmonary problems may occur
    - Chlamydia is shed in feces or ocular, respiratory or reproductive tract secretions
  - Reported to occur commonly in
    - Pigeons, sparrows, tits, grackles , psittacines and doves
    - Waterfowl, raptors and hummingbirds
    - Deer, bighorn sheep and ibex
    - Rabbits, hares and muskrats
      - High mortality

Chlamydia

- Transmission
  - Can cross species although different strains and species have host preferences
  - Commonly from symptomatic or asymptomatic carrier
  - Direct contact
  - Exposure to infectious aerosols
  - Spread by contaminated fomites
  - House cats can also spread disease

Chlamydia

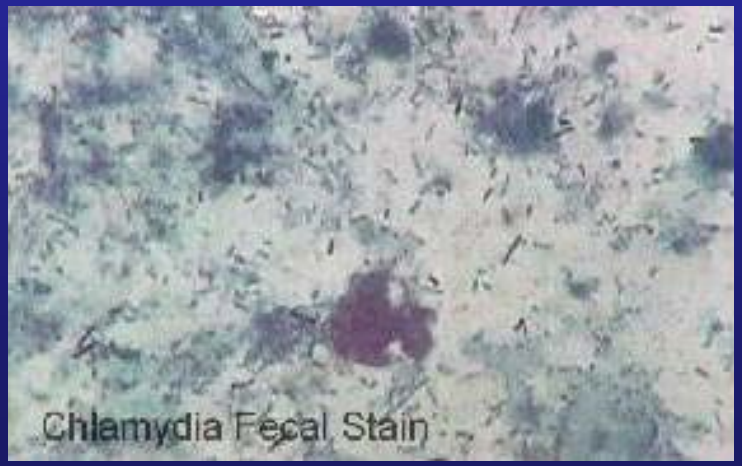
- Clinical signs
  - Listlessness
  - Weight loss
  - Anorexia
  - Respiratory involvement
    - Classic psittacosis in birds
      - Air sacculitis
    - Upper respiratory infections in ruminants and cervids
  - Keratoconjunctivitis
  - Rhinitis
  - Dyspnea
  - Diarrhea
  - Systemic infection
    - Liver function compromised
      - Biliverdinuria (green urine)
  - CNS sign less commonly
    - Convulsions, tremors, head tilt and posterior paresis
- Infertility and high nestling mortality with or without clinical signs in adults

Chlamydia

- Laboratory findings
  - Depends on severity of infection and organs affected
    - Leukocytosis
    - Anemia
    - Increases in AST, LDH, TP, Bile acids, uric acid and beta globulins
- Radiographic, laparoscopic or post mortem findings
  - Hepatomegaly
  - Splenomegaly
  - Thickening of air sacs
  - Fibrinopericarditis
  - Pneumonia
  - Enteritis
  - Nephrosis

Chlamydia

- Diagnosis
  - Antigen capture
    - Fecal or tissue culture
  - Antibody detection
    - Elisa
  - Both have false positives
- Histopathology of affected organs show inflammation and necrosis
- Reportable disease in some areas



Chlamydia

- Treatment
  - Must quarantine while treating
  - Retest 4 weeks post treatment
  - Doxycycline
  - Chlortetracycline
  - Fluoroquinolones

Common Contagious Diseases of Concern

Parasitic

Coccidia

- Protozoan parasite
  - Commonly *Isospora* or *Eimeria spp.*
- Infects a wide variety of vertebrate hosts
- Each species of coccidian tends to be restricted to a narrow range of hosts
- Each host species may be infected with several species of coccidia simultaneously

Coccidia

- Part of the life cycle takes place in the epithelial cells lining the GI tract or ceca
  - Can be in the kidneys in birds
  - Development is entirely intracellular in host
- Cycle may be direct or indirect
  - Indirect relies in part upon predator-prey relationship
- Transmission is direct
  - Ingestion of sporulated oocyst

Coccidia

- Difficult to eliminate from environment
- Very hardy
  - Heat and sunlight will kill the spores
- Autoinfection is most common
  - Can lie dormant and come out in times of stress
- Oocysts are ingested & move into intestinal lining
- Life cycle begins
- Intestinal cells are damaged
- Oocysts are shed in the feces in 4-8 days
- Oocysts sporulate in 12-30 hours & become infective

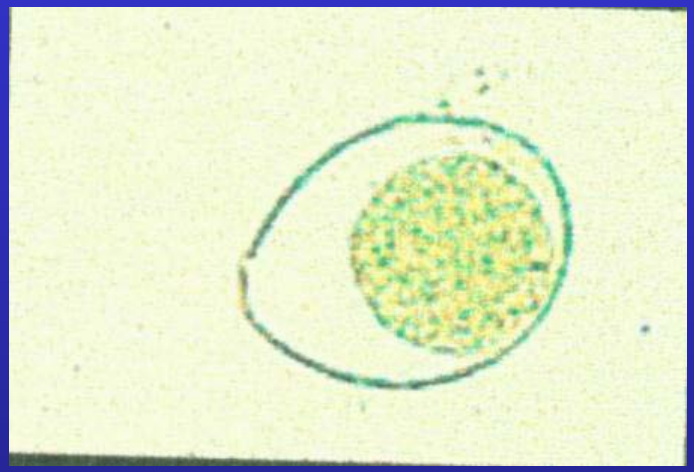
Coccidia

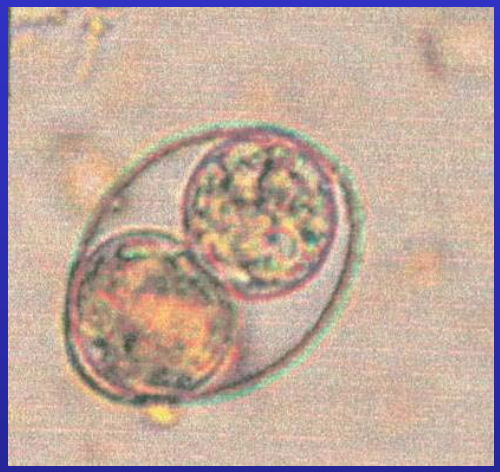
- Clinical signs (not limited to but may include)
  - Enteritis/dysentery
    - Diarrhea can be the only sign
  - Emaciation
  - Anemia
  - Death
  - Renal disease in geese
  - Can have blood in stool

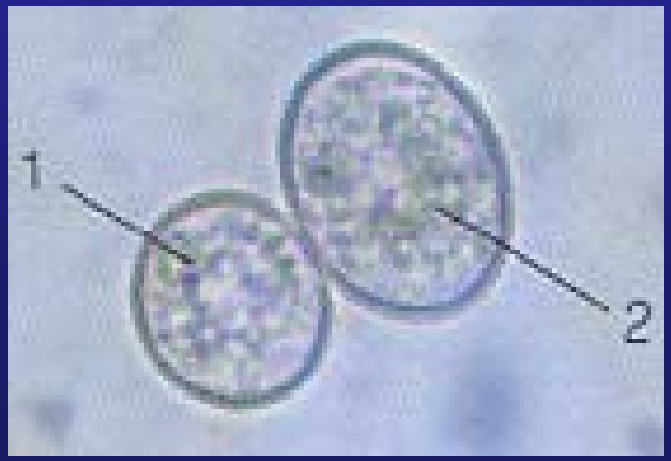
Coccidia

- Treatment
  - Often said to be "self-limiting"
    - Infective organisms grow to a maximum
    - Fades away to extinction as host develops immunity
  - Need to control once in population with prophylaxis
    - Want sufficient protection to allow animal to develop immunity without getting sick
      - Monensin (CoBan 60), Amprolium, Decoquinate (Deccox), Diclazuril, Lasalocid, Rofenaid and some sulfas
  - Supportive therapy
    - Once oocysts are seen in feces drugs have less of an effect
    - Need to treat long term
      - 10 days to 6 weeks
      - Albon (Sulfadimethoxine) and TMS

Coccidia







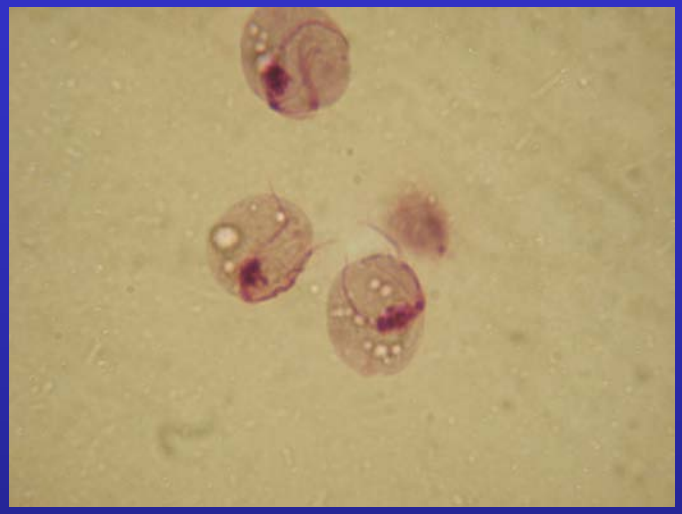
Canker

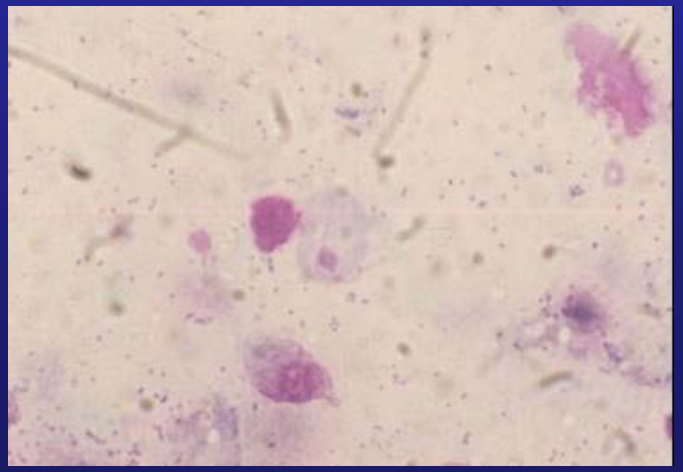
- Called “Frounce” in raptors
- Infects birds, most commonly pigeons, doves, grackles, raptors
- *Trichomonas, Candida* or *Monilla*
- Affects GI tract, particularly upper intestinal tract and oral cavity
- See caseous white-yellow plaques in oral cavity, dysphagia and vomiting

Obtaining a Sample When Canker is Suspected

Canker

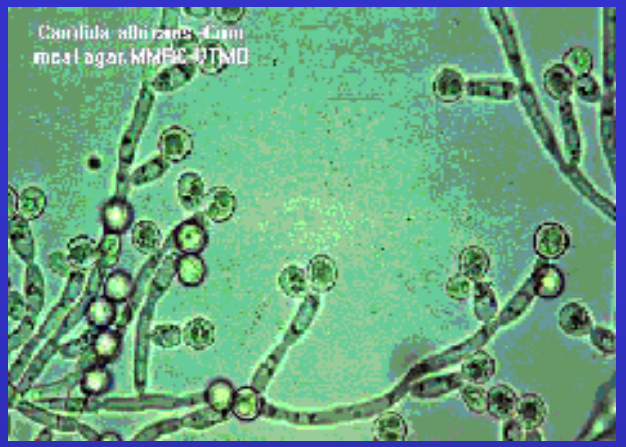
- Identification is confirmed by microscope
- Trichomonas is an extracellular parasite
  - Measures 8-14μm in length
    - (may vary in different host spp)
  - 4 anterior flagella
  - Undulating membrane
  - Jerky movement
  - Body diameter remains constant as it moves

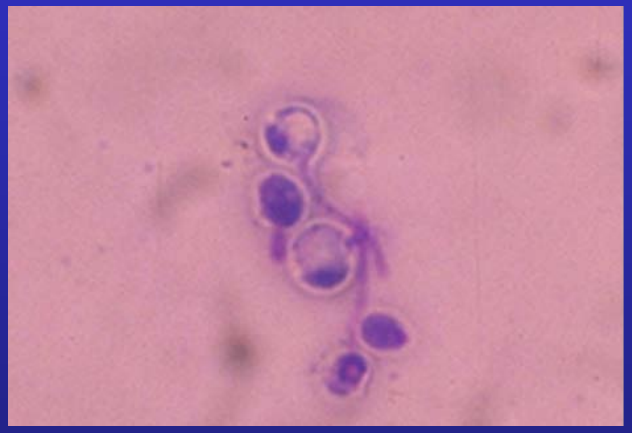


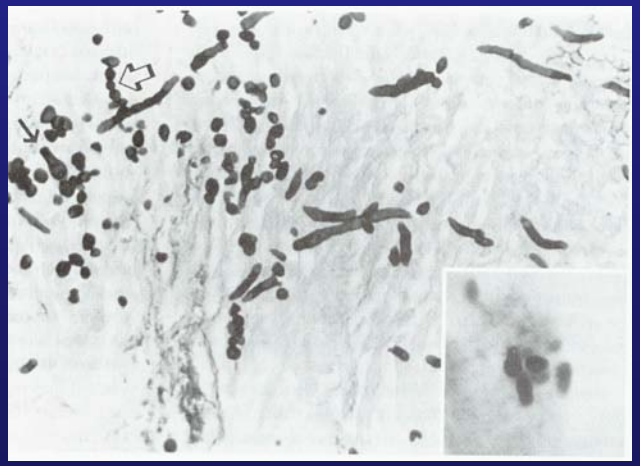


Canker

- Identification is confirmed by microscope
- *Candida* is an opportunistic yeast
- Gram stain , Diff-Quik and new methylene blue will help visualize
- See budding yeast and nonbranching pseudohyphae







Canker

- Identification is confirmed by microscope
- *Monilla* is a fungus
  - VERY rare
  - *Trichomonas* is the most common organism seen
- Gram stain , Diff-Quik and new methylene blue will help visualize
- See branching hyphae

Canker

- Affected birds may have diarrhea as well
- Easily spread through drinking water, food and direct contact with oral fluids
  - No intermediate host or vector required
- If animal is not eating, prognosis is very poor
- Early treatment is key
  - Nystatin if fungal
  - Carnidazole for *trichomonas*

Common Contagious Diseases of Concern

Fungal

Aspergillosis

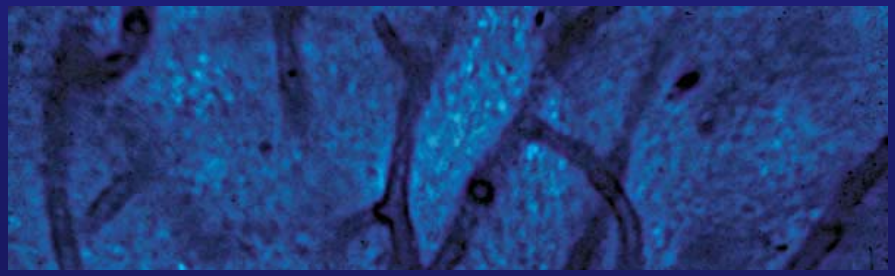
- Saprophytic fungus
- Most often *Aspergillus fumigatus*
- Infects humans, animals and birds
  - Even marine species
- Transmitted via airborne spores
- Source of infection is environmental
  - Ubiquitous
  - Moldy straw
  - Moldy feed
- Not transmitted animal to animal

Aspergillosis

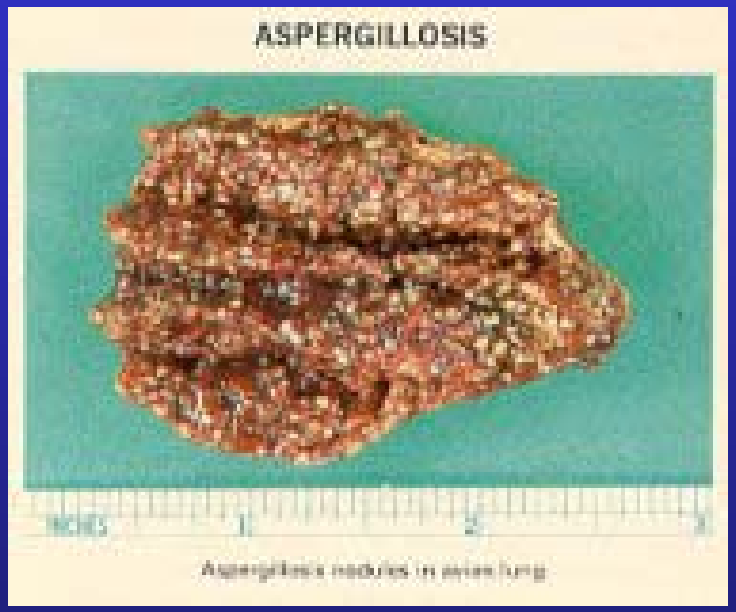
- Infections are usually systemic
- Lungs and air sacs are infected first
- Problem for immunocompromised and chronically ill individuals
  - People can contract when performing necropsies
- Clinical signs are respiratory
  - Dyspnea
  - Depression
  - Emaciation
  - Open mouth breathing
  - Respiratory noise

Aspergillosis

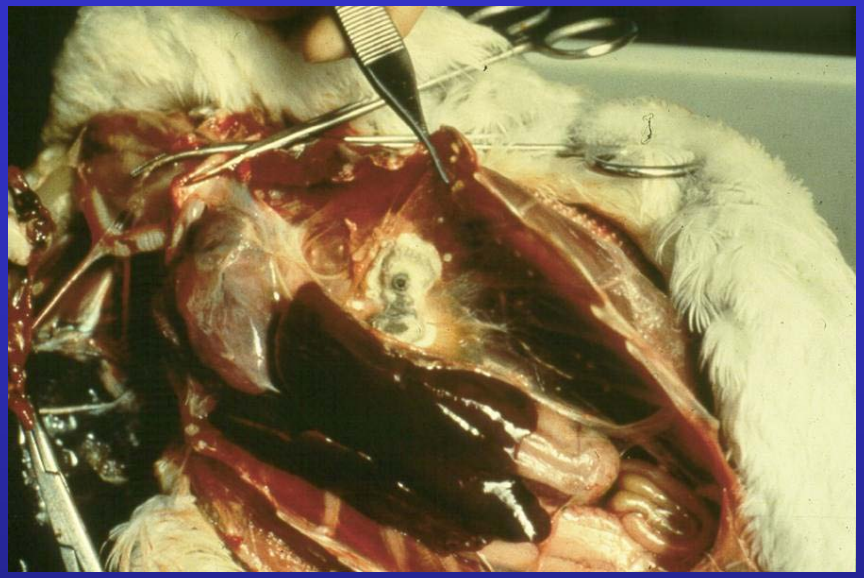
- Destruction of adjacent tissue can be extensive
- May see hemorrhaging due to erosion of adjacent blood vessles
- Culture alone is not enough to diagnose since ubiquitous
  - Need lesions in conjunction with culture
- Branching septate hyphae sometimes with spores
  - Lactophenol cotton blue
  - New methylene blue

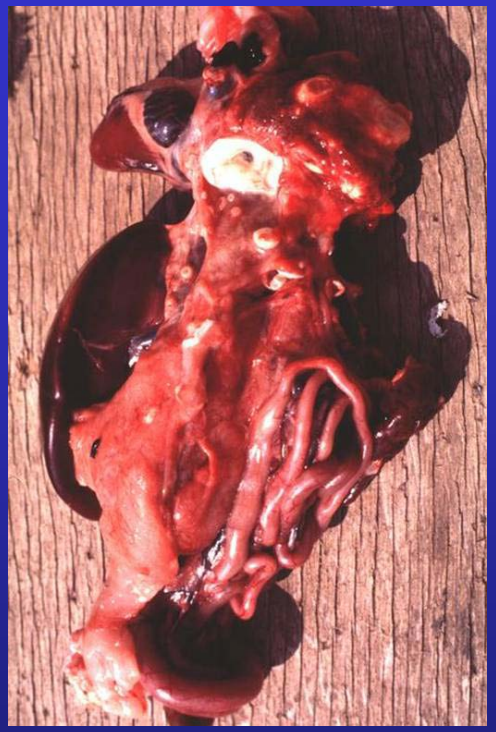


Aspergillosis



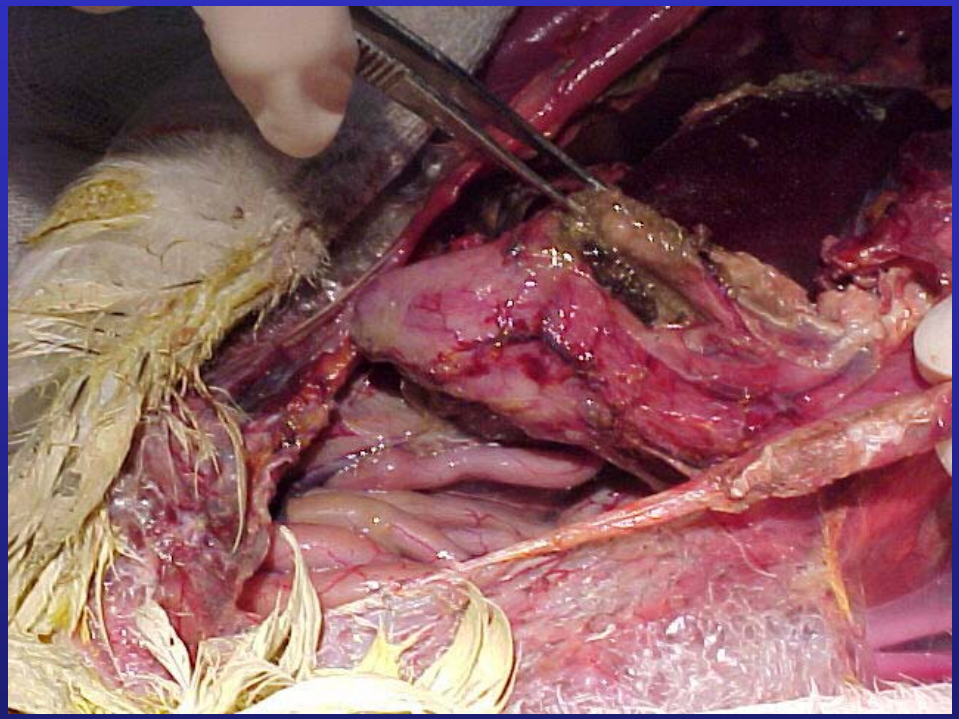
Aspergillosis

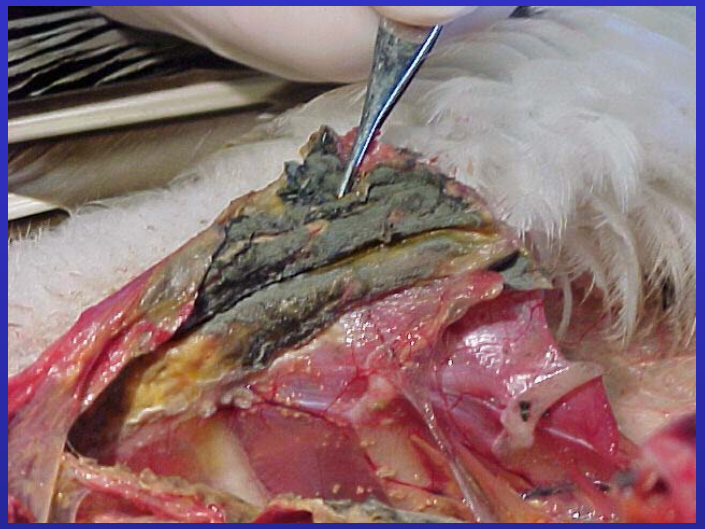


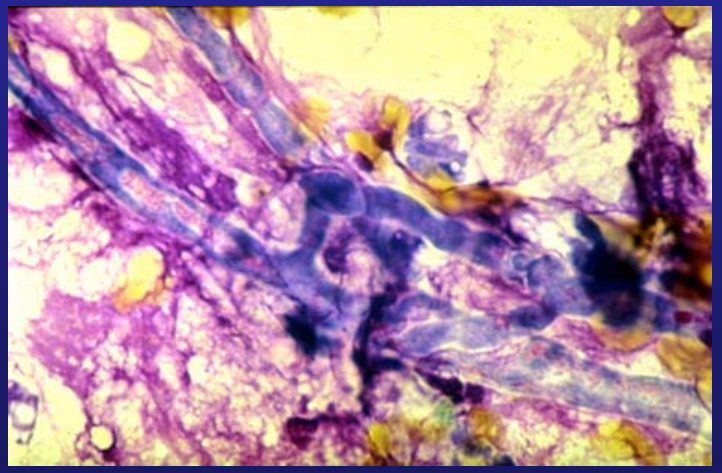


Plaque-like structures produced by Aspergillus sp. on serous membranes

Aspergillosis







Aspergillosis

- Treatment
  - Ketoconazole
  - Itraconazole
  - Fluconazole
  - Clotrimazole
    - As flush if can reach infected area to flush
  - Amphotericin-B
    - Reptiles
    - Lagomorphs with fluconazole