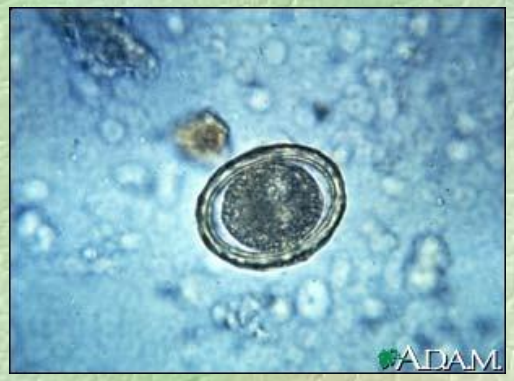
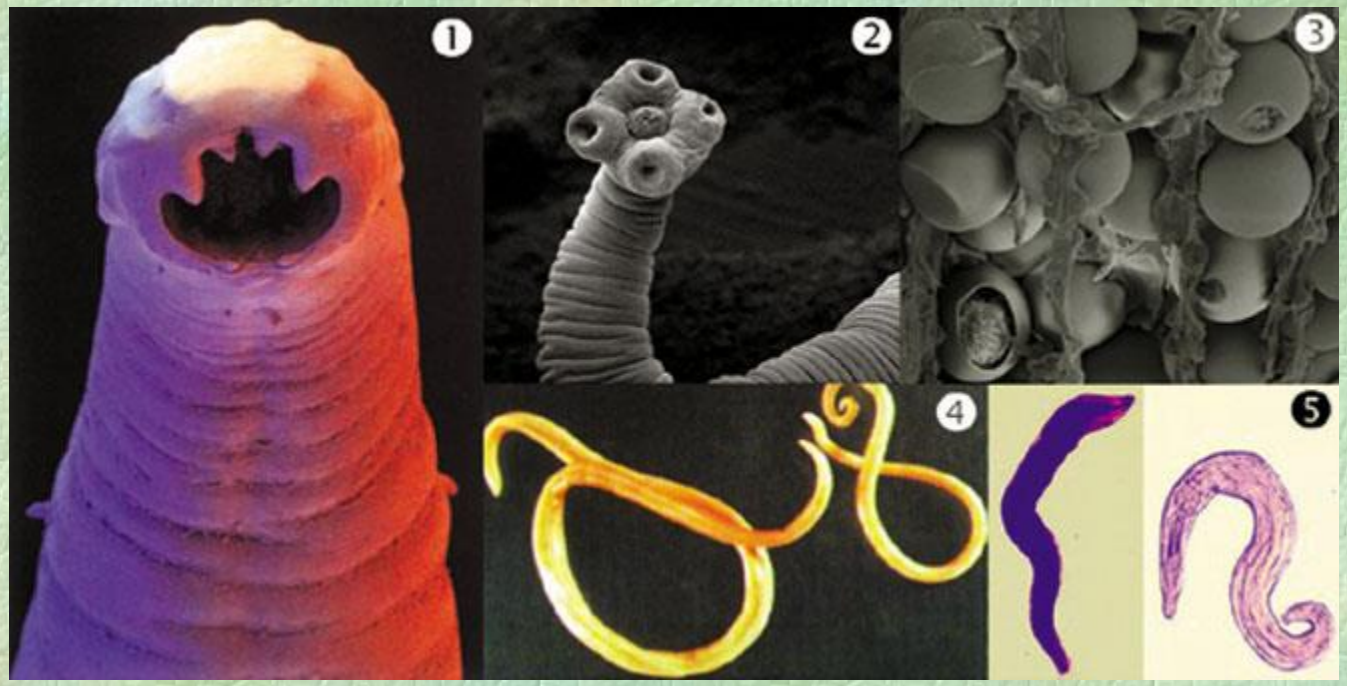
ZOONOSIS

What you don’t know may hurt you.

Carla M. Johnson

ZOONOSIS





(1) The hookworm latches on the walls of the colon with its sharp teeth where it feeds on blood. (2) The tapeworm is the longest parasite. A mature adult can lay a million eggs a day. (3) Tapeworm eggs embedded in the colon. (4) The roundworm can grow to be 20 inches (50 cm) long and lay 200,000 eggs per day. (5) Pinworms migrate outside the colon during the night to lay their eggs around the anus. This causes the nightly itching of many unsuspecting victims.

SO MANY THINGS LURKING OUT THERE THAT THESE ANIMALS CAN PASS ON TO US

ZOONOSIS

* Zoonoses Defined
  - Importance to Wildlife Rehabilitators
* Causative Agents:
  - Bacteria, Viruses, Parasites, Fungi & Protozoal
* Disease Prevention & Control
  -Handwashing Techniques
* Emerging Issues and Human Health Concerns:
  -Increase in vector born illnesses
  -Microbial resistance
  -Biosecurity & Bioterrorism

ZOONOSIS

*Diseases that pass between animals and humans…..

Understand this

Or

Eat Poop and Die!

* You should focus on:

<u>How you can get</u>

&

<u>Ways to protect yourself from disease</u>

*It is estimated that there are more than 780 infections & diseases of animals that are transmissible to humans under certain conditions.

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Disease Control & Prevention

Disease Transmission:

- Directly from one vertebrate host to another via direct contact.
- Indirect transmission via intermediate host (vectors) ticks.
- Indirect transmission involving aerosol particles or fomites.

Disease enters the body by 1 or more of 6 routes:

- Inhalation
- Inoculation-bite
- Through mucosa
- Ingestion
- Through a break in the skin
- Passing through the skin

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Causative Agents:

Bacteria (Bacterial Diseases)

Chlamydiosis/Psittacosis/Ornithosis, Leptospirosis, Lyme Disease, Rocky Mountain Spotted Fever, Salmonellosis, Tularemia

Viruses

California Encephalitis/La Crosse Encephalitis, Hantavirus Pulmonary Syndrome (HPS), Rabies, West Nile Disease, COVID-19

Parasites

Ascariasis, Babesiosis, Baylisascaris procyonis (raccoon roundworm), Cryptosporidiosis, Giardiasis, Toxoplasmosis, Toxocariasis (Visceral Larval Migrans), Trichinosis

Fungi/Mycoses

Aspergillosis, Cryptococcosis & Histoplasmosis, Ringworm

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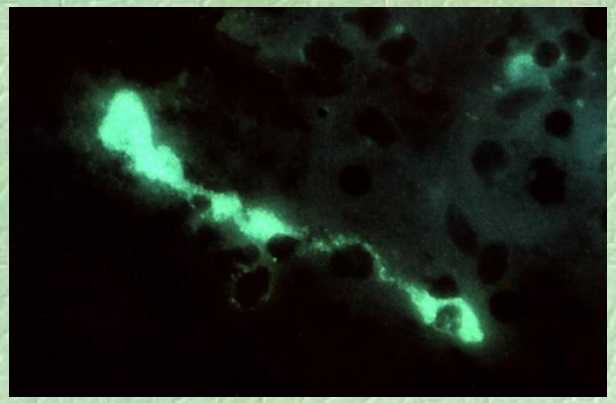
Causative Agents



Bacteria:

Chlamydiosis → Psittacosis/Ornithoisis

***Chlamydia Psittaci**

***Aerial transmission of dried secretions by pet birds, turkeys, chickens, ducks, sparrows & gulls**

***Fever, chills, headache, muscle aches, dry cough**

***Can be difficult to diagnose**

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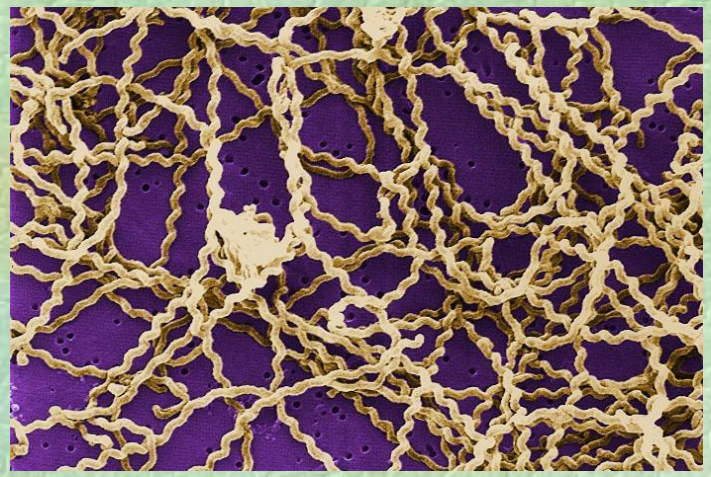
Causative Agents



Bacteria:

Leptospirosis

*Leptospira

*Exposure to urine contaminated water by cattle, pigs, horses, dogs, rodents and squirrels (rodents shed their entire lifetime w/o clinical signs)

*2 days to 4 weeks

*1st stage = fever, chills, headache, muscle aches, vomiting & diarrhea

*2nd stage = Weil's disease = kidney/liver failure or meningitis

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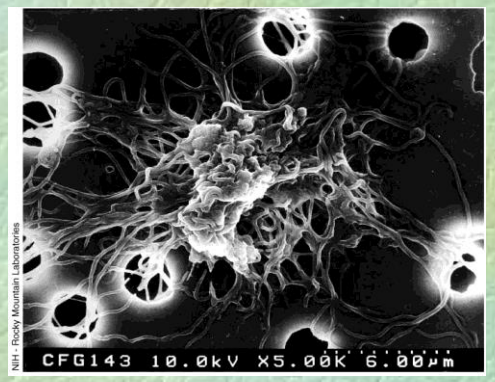
Causative Agents:



Bacteria:

Lyme Disease

***Borrelia Burgdorferi**

***First characterized in US in 1976**

***White-footed mouse, fox, raccoon, opossum, deer - 3-host tick**

- 1st stage = rash at bite site, flu like symptoms
- 2nd stage = weeks to months later = cardiac & neurological abnormalities
- 3rd stage = months to years later = arthritis of large joints & chronic skin infections

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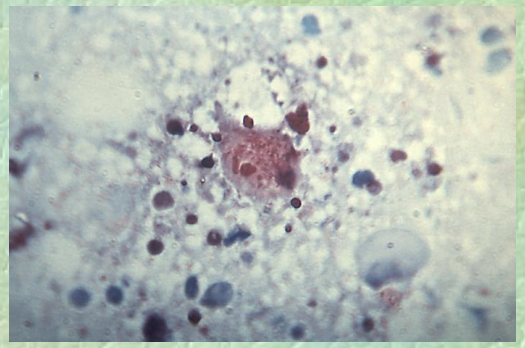
Causative Agents:



Bacteria:

Rocky Mountain Spotted Fever

***Rickettsia rickettsii**

***American Dog Tick and Rocky Mountain Wood Tick**

***White-footed mouse, fox, raccoon, opossum, deer - 3-host tick**

***Flu-like symptoms including lack of appetite show up 3-14 days after bite**

***Treatment is by antibiotics**

***If left untreated can cause organ & tissue damage and death within 8 days of first symptom**

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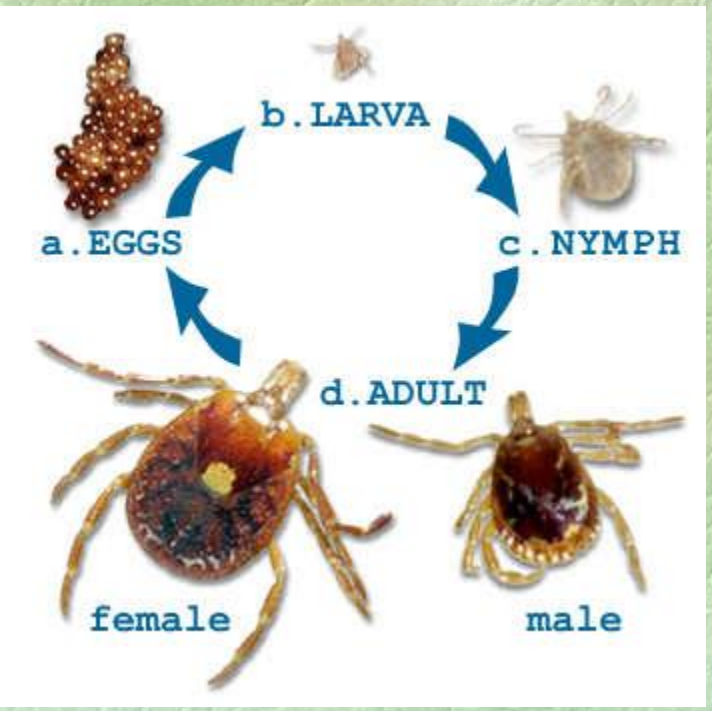
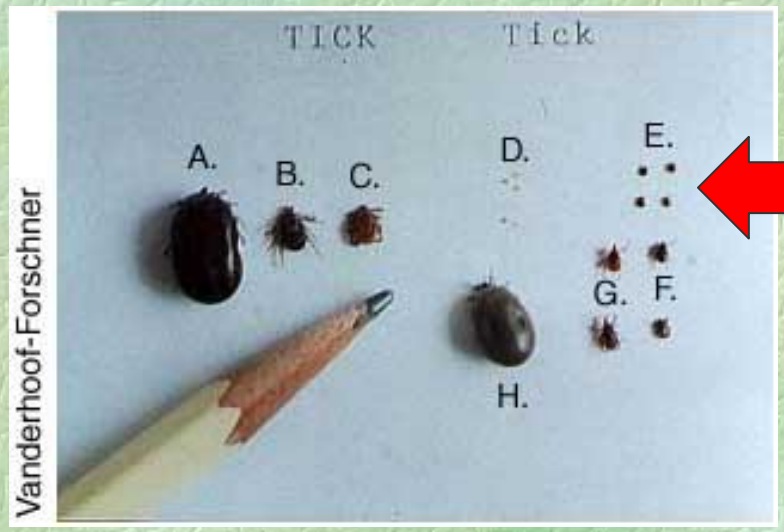
Causative Agents:

Bacteria:

Rocky Mountain Spotted Fever

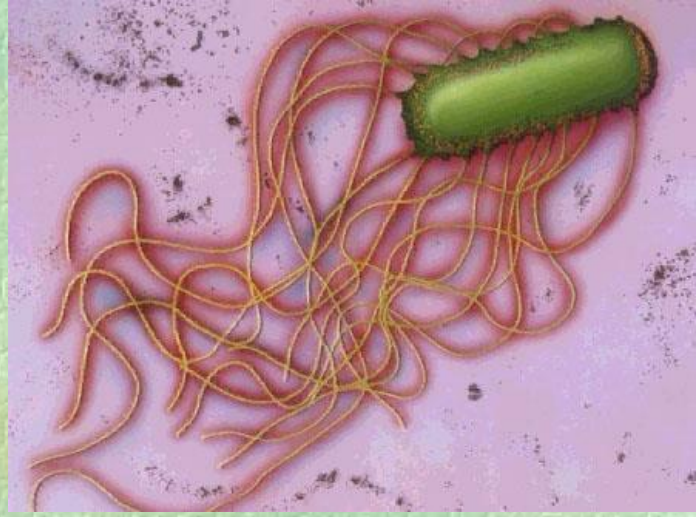
***Transmitted through saliva after several hours of attachment**
***Ticks b/c infected in either larval, nymphal or adult stages**





A. Engorged female
B. Female
C. Male
D. Larvae
E. Nymphs
F. Males
G. Females
H. Engorged female

ZOONOSIS



Causative Agents:

Bacteria:

Salmonella

*Salmonella

*Occurs in mammals, birds, & reptiles.

*One of the world's most widespread diseases.

*6 hrs to 6 days

*Diarrhea, fever and abdominal cramps

*Lasts 4 to 7 days and is usually self-limiting

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Causative Agents:

Bacteria:

Tularemia

***Francisella tularensis**

***Occurs in rodents, rabbits & hares.**

***Transmission by infected tick, deerfly or insect**
***Handling infected animal carcasses**
***Eating/drinking infected food/water**
***Inhaling the bacteria**

***Sudden fever, chills, headaches, diarrhea, muscle aches, joint pain, dry cough, progressive weakness, pneumonia chest pain, trouble breathing**

Consult your doctor at first sign of illness

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Causative Agents: Virus

La Crosse Encephalitis

*Chipmunks, squirrels, mosquitoes

*Survives the winter in the mosquito

*Incubation period 5-15 days

*Fever, headache, nausea, vomiting, lethargy

*Inflammation of the brain, CNS signs

2010–2019

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Causative Agents: Virus

Hantavirus Pulmonary Syndrome (HPS)

Rodents shed virus in urine, droppings and saliva

Initial symptoms: fatigue, headache, muscle aches, dizziness, chills & vomiting

4-10 days after initial symptoms: coughing and shortness of breath

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Causative Agents:

Virus


Common House Mouse

Lymphocytic Choriomeningitis (LCM)

Mice, rats, hamsters, guinea pigs carry for lifetime but show no signs

Shed virus in urine, droppings and saliva = aerosolization, break in skin, bite, organ transplant

8-13 days after exposure

1st phase = flu-like symptoms for up to 2 weeks
recover for a few days
2nd phase = meningitis, encephalitis and hydrocephalus coma

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Causative Agents:

Virus

Rabies:

*** All warm-blooded mammals can transmit the disease, especially bats.**

***High rates of infection in Skunks, Raccoons and Foxes**

***Rare in Rodents, Lagamorphs, and Opossums.**

The best protection for you and the animal in your care is

TO AVOID BEING BITTEN, SCRATCHED OR LICKED!!

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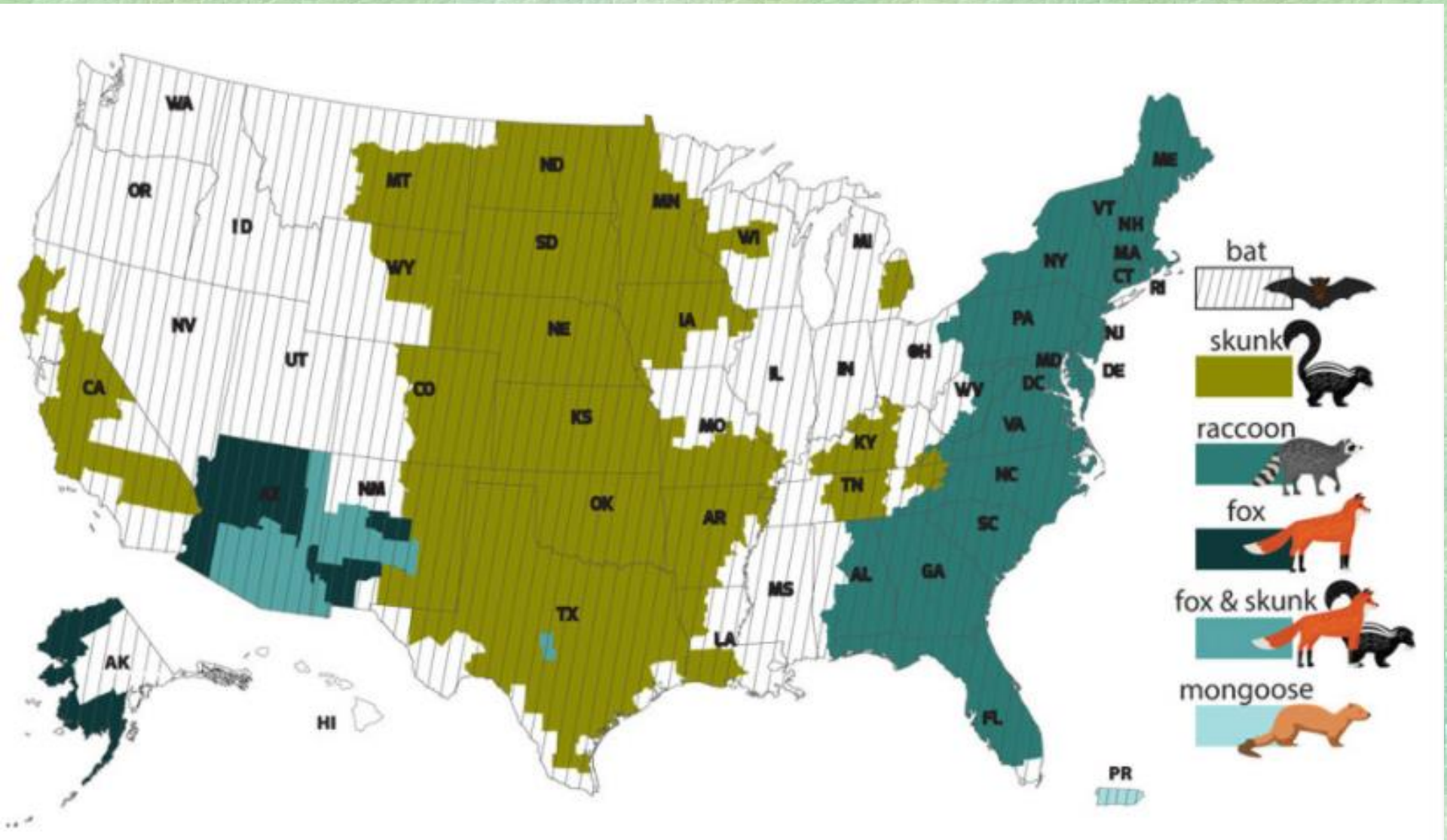
Distribution by animal across the US



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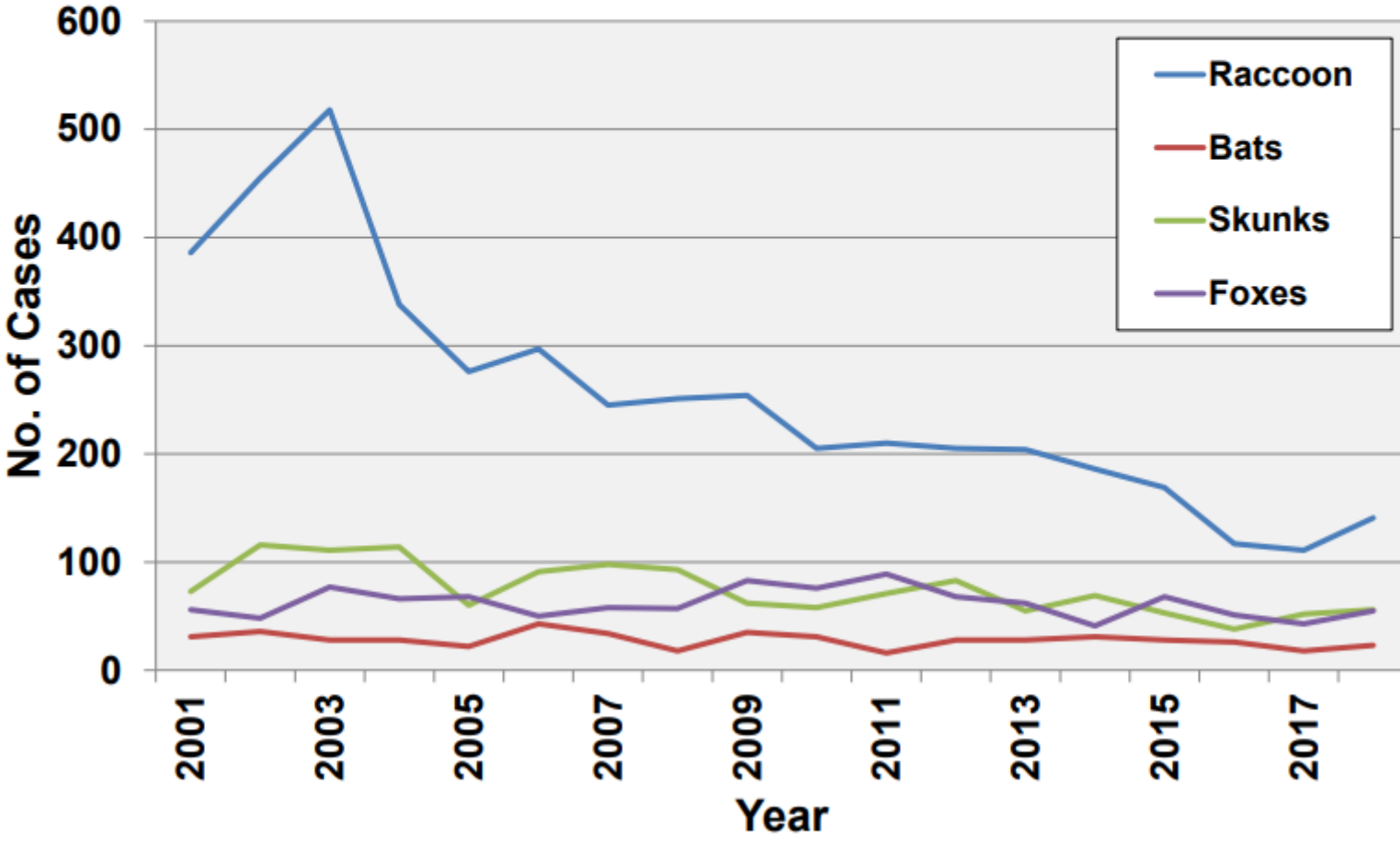
Rabies North Carolina: Number of Positive Wild Mammals by Species by Year, North Carolina, 2001 – 2018 (n = 7,542)



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Causative Agents:

VIRUS

Mosquito

West Nile Virus

*** 3 to 14 days after being bitten**

*** 80% of people don't show symptoms**

*** 20% = fever, headache, body ache, nausea, swollen glands**

***.01% of 20% = high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis**

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Causative Agent:

PARASITES:

* Baylisascaris procyonis (raccoon roundworm)
* Baylisascaris columnaris (skunk roundworm)
* Babesiosis
* Cryptosporidiosis
* Ehrilichiosis
* Giardiasis
* Toxoplasmosis
* Trichinosis
* Toxocariasis (Visceral Larval Migrans)

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Causative Agent:
PARASITES

Baylisascaris procyonis (Raccoon Roundworm)

*Millions of eggs produced in intestine and passed out in feces

*Does not affect raccoon

*Nausea, tiredness, liver enlargement, loss of coordination, lack of attention to people/surroundings, loss of muscle control coma, blindness and possibly death

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Causative Agent:

Bacteria


Cryptosporidium Oocyst

Cryptosporidiosis

Symptoms:

Dehydration
Weight loss
Stomach cramps or pain
Fever
Nausea
Vomiting

usually last about 1 to 2 weeks.
The symptoms may go in cycles in which you may seem to get better for a few days, then feel worse again before the illness ends

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Causative Agents:

FUNGI OR MYCOSIS:

Aspergillosis – lung fungus from moldy hay also called farmer's lung

Cryptococcosis – yeast like lung fungus that sometimes spreads to the brain

Histoplasmosis – fungus found in bird and bat droppings; not serious if confined to lungs but fatal if spread throughout body

Ringworm – also known as athlete's foot or jock itch, caused by fungus

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Causative Agents:

PROTOZOAL DISEASES:

***Giardiasis - Most frequently diagnosed intestinal parasitic disease in the US.**

***Toxoplasmosis - common source is cats.**

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Disease Control & Prevention

Rationale: You can't provide good rehabilitative care if you are sick.

Prevention of Disease Transmission:

Good Handwashing
Good Cleaning protocols
Careful handling of animals
Proper disposal of fecal materials
Proper protective gear
Using your common sense

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HANDWASHING

Fingernail Brush, Latex Gloves

When should you wash your hands?

Rehab Space
New Intakes
Cleaning cages
Feeding animals/litters
Handling patients
Bedding/Nest Box
Exiting Rehab Space

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CLEANING PROTOCALS

Cleaning versus Disinfecting

Cleaning Solutions – There are many

1:10 BLEACH TO WATER SOLUTION

Just as a wildlife rehabilitator would never neglect the care of an animal, never neglect the care of the workplace

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HANDLING ANIMALS

Caution must be taken when handling all wildlife, even babies

Do not allow babies to lick you or climb all over you. NO FRENCH KISSES!!

Capture & Restraint of Small Mammals & Birds

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Proper disposal of fecal material and proper protective gear

Double bag rehab trash

When to wear gloves, mask, face shield, etc.

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COMMON SENSE

ZOONOSIS

Emerging Issues & Human Health Concerns:

*Increased vector born illness

*Microbial resistance

*Biosecurity & Bioterrorism

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Useful WEB Sites:

Emerging Infectious Diseases, CDC
http://www.cdc.gov/ncidod/eid/vol4no3/murphy.htm

Field Manual of Wildlife Diseases,
http://www.nwhc.usgs.gov/pub_metadata/field_manual/field_manual.html

Health Concerns to be Aware of When Working With Wildlife (a.k.a.-Zoonoses)
The Humane Society of the United States
www.tc.umn.edu/~devo0028/zoonos.htm

Melissa Kaplan's Herp Care Collection
http://www.anapsid.org/mainzoonoses.html

Overview of Zoonoses, LA Public Health, Veterinary Public Health
http://www.lapublichealth.org/vet/guides/vetzooman.htm

Pariasitic Pathways, Division of Parasitic Disease, CDC
http://www.cdc.gov/ncidod/dpd/parasiticpathways/animals.htm

ZOONOSES or Everything I Didn't Want to Know About Wildlife Diseases
www.anglefire.com/nj/woundedknee/zoonoses.html

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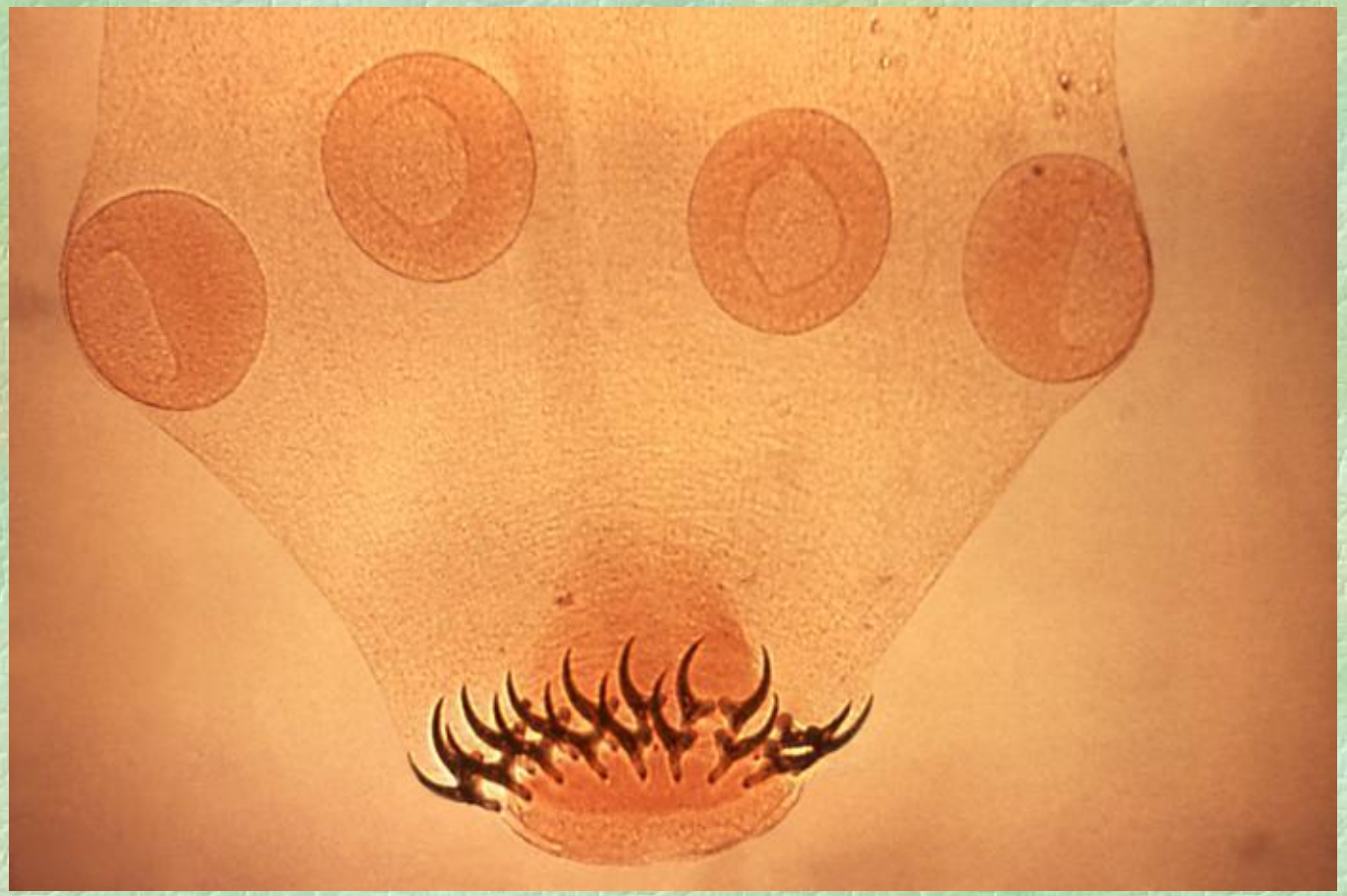

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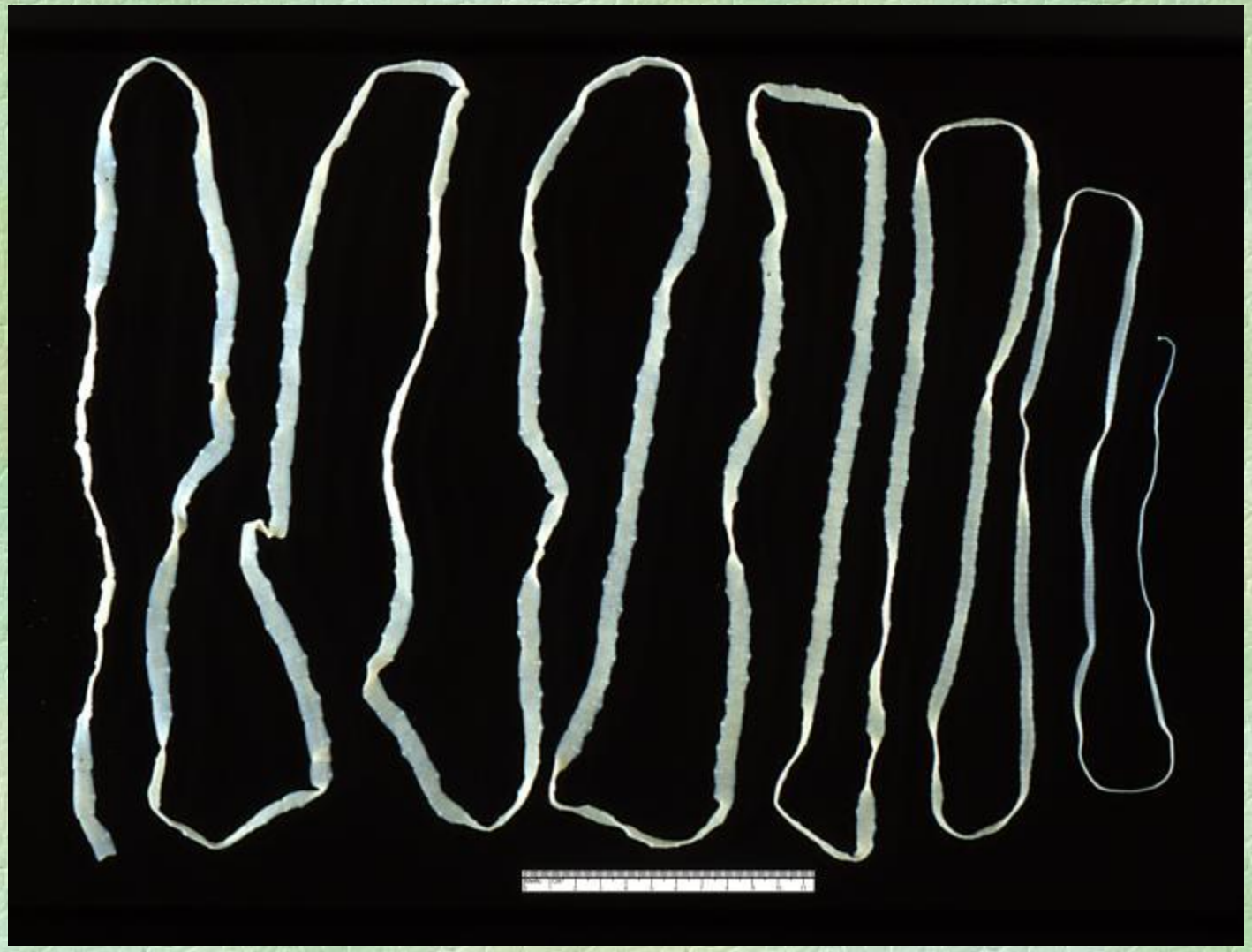

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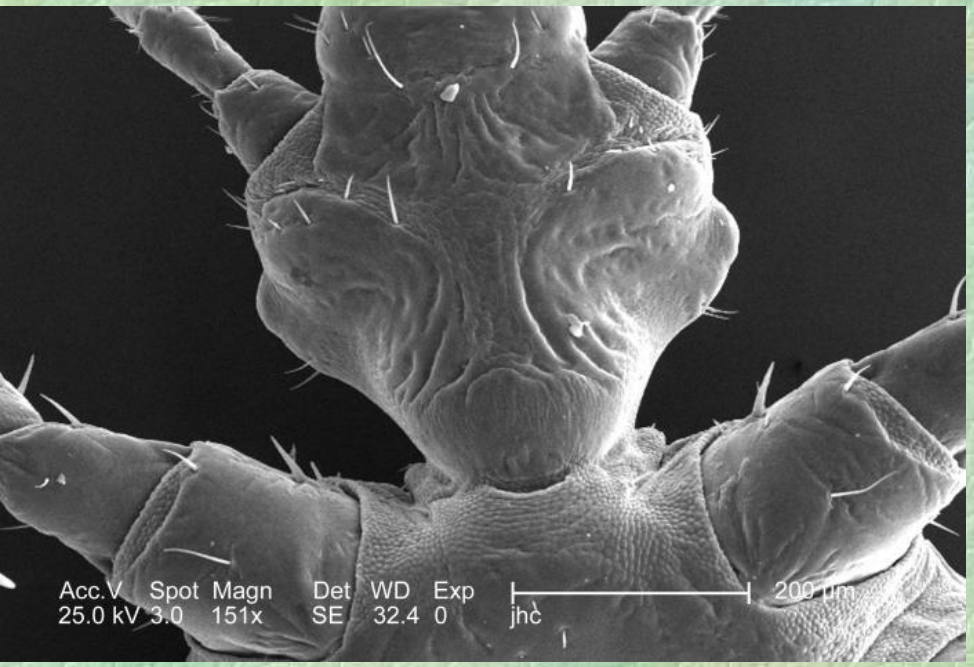
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ZOONOSIS

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NOW LET'S WATCH A CDC VIDEO ON PROPER HAND WASHING TECHNIQUES