

ZOOONOTIC INFECTIONS TRANSMITTED BY OUR PETS



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Objectives

1. Identify infectious diseases that are transmitted by household pets.
2. Describe the modes of transmission of various zoonotic diseases.
3. Discuss recent outbreaks of zoonotic diseases in the U.S.

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Our beloved pets

- Over 60% families own a pet
- Health benefits:
 - Lowers BP, cholesterol, & triglycerides
 - Less cardiovascular events
 - Reduces stress, depression, & anxiety
 - Increase exercise & outdoor activity
 - Better cognitive function

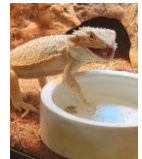


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Our beloved pets also....

- May cause disease in humans
- Millions of infections annually
 - Self-limiting to life threatening
- High risk:
 - Infants and children
 - Immunocompromised
- Parasites, fungi, and bacteria



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Cat Scratch Disease

Bartonella henselae

Spread by cats

~40% cats carry the bacteria at some time in their lives

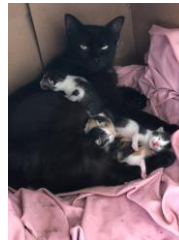
Occurs most often in children under 15

More common in southeast U.S.

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Bartonella henselae – Route of Transmission

- Cat exposed
 - Flea bites or flea droppings
 - Fighting with an infected cat
- Infected cat licks a person's open wound
- Cat scratch or bite that breaks the skin
- Infection about 3-14 days after exposure



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Signs & symptoms of Cat Scratch Disease

- Infected area swollen & red
 - Raised lesion
 - Pustule at sight of scratch
- Fever
- Headache
- Poor appetite
- Exhaustion
- Swollen lymph nodes near site of infection

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Diagnosis of Cat Scratch Disease

- Typically diagnosed based on signs & symptoms, with exposure history
- Difficult to culture
 - Notify micro lab if suspected
 - Fastidious, slow-growing bacterium
 - Cultures held 21 days
- Molecular testing from lymph node aspirate (not recommended)
- Infection usually resolves without treatment



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Toxoplasmosis

- One of the most common zoonoses
- Caused by *Toxoplasma gondii*
- 11% U.S. population over age 6 have been infected
- Over 40 million humans in US are carriers
- How are humans infected?
 - Direct contact with cat feces, consumption of undercooked, contaminated meat or shellfish



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Toxoplasmosis and Cats

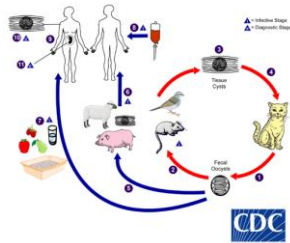
- Cat infected after eating infected rodents, birds, or other small animals
- Parasite passed in cat's feces
 - Millions of parasites shed in feces as long as 3 weeks after infection
 - Mature cats less likely to shed *Toxoplasma* if previously infected
- Route of transmission - oocysts



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Route of transmission:

- Accidental ingestion of oocysts
 - Cleaning litter box
 - Touching/ingesting anything that came in contact with cat feces
- Contaminated soil
- Contaminated water



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Signs & Symptoms of Toxoplasmosis

- Adults usually asymptomatic
- Symptoms vary:
 - Cervical lymphadenopathy and mono/flu-like illness → generally self-limited
 - Damage to brain, eyes, or other organs in acute infection
 - Ocular toxoplasmosis → reduced or blurred vision, pain, redness of eyes
- Severe disease in immunocompromised

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Toxoplasmosis – Risk Factors

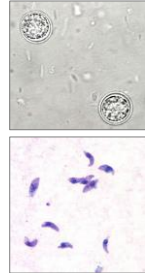
- Pregnancy/Infants
 - Acute (new) infection may lead to serious congenital infection, miscarriage, or stillborn
 - Typically, do not see symptoms at birth (small percentage born with serious eye or brain damage) – later in life may have vision loss, mental disabilities, or seizures
 - If infected prior to pregnancy, unborn child is protected due to mother's immunity
- Immunocompromised individuals



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Diagnosis of Toxoplasmosis

- Serological testing
 - Primary diagnostic method
 - IgG and IgM
- Molecular testing on amniotic fluid
- Direct observation of Toxoplasma in tissue sections, CSF, or biopsy



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Psittacosis

- Ornithosis or parrot fever
- *Chlamydia psittaci*
- Droppings and respiratory secretions of infected birds
- Pet birds
- Fewer than 10 cases annually
- Since 1998, decline in reported cases



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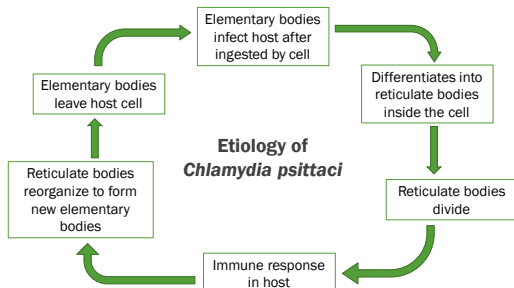
Route of Transmission

- Contact with infected birds
 - Bacteria shed in droppings and respiratory secretions
- When droppings or secretions dry, small dust particles containing the bacteria get in air
- Particles are inhaled
- Rarely spread person-to-person
- Symptoms develop 5-14 days after exposure



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Etiology of *Chlamydia psittaci*



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Signs & Symptoms of Psittacosis

Humans

- Presents as acute, febrile respiratory illness
- Usually, very mild illness
- Fever & chills
- Headache
- Muscle aches
- Dry cough

Birds

- Poor appetite
- Inflamed eyes
- Breathing difficulty
- Diarrhea

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Diagnosis of Psittacosis

- Often difficult to diagnose because symptoms are similar to many other respiratory illnesses
- Serological testing for *C. psittaci* antibodies
- May be isolated from sputum or pleural – rarely performed
 - Sent to reference laboratories
- PCR can distinguish *C. psittaci* from other chlamydial species

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Dermatophytosis

- Ringworm
- Name comes from the shape of the rash
- Fungal infection
 - Usually, *Trichophyton*, *Microsporum*, or *Epidermophyton*
- Infects skin and scalp
 - Tinea corporis
 - Tinea capitis



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Ringworm – Route of transmission



- Direct skin-to-skin contact
- Direct contact with infected animal
- Contact with infected items
- Cats & dogs

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Signs & Symptoms of Ringworm



Humans

- Characteristic ring-like rash
- Itching starts 4-14 days after contact
- Rash may be scaly, reddened, and circular
- In scalp – makes bald patch of scaly skin

Pets

- Adults may not show signs of ringworm
- Puppies and kitten – hairless, red, crusty, circular patch
- Affect claws – whitish, opaque appearance, or shredding of claw's surface

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Diagnosis of Ringworm

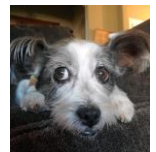
- Typically diagnosed by simply looking at it
 - Distinctive rash
- Skin scraping may be collected
 - Fungal culture



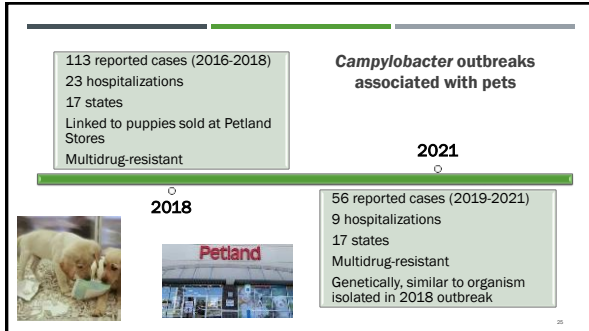
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Campylobacteriosis

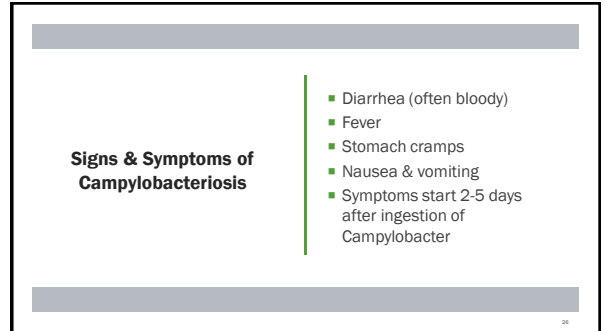
- CDC estimates *Campylobacter* as the #1 cause of bacterial diarrheal illness in U.S.
- Cats and dogs may be carriers
 - May lead to an infection in people
- Outbreaks uncommon, despite the high number of illnesses caused by *Campylobacter*
 - Frequency rising



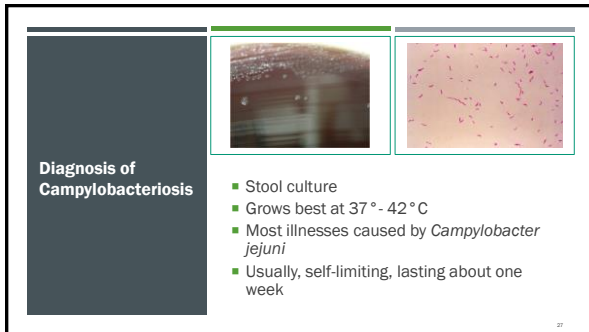
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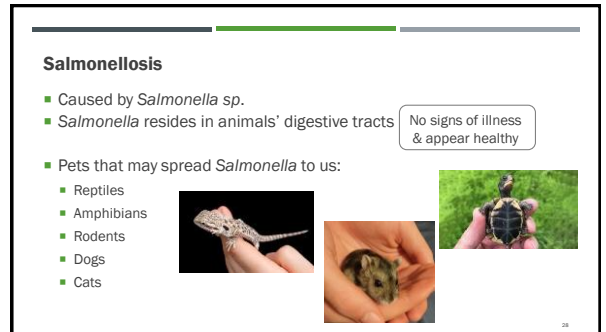
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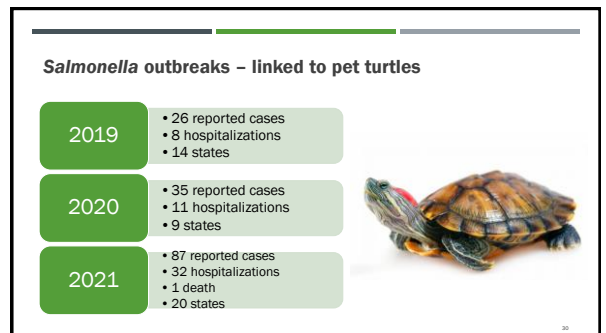
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Salmonella outbreaks – linked to bearded dragons

Year	Reported cases	Hospitalizations	States
2014	166	61	36
2020	18	11	11
2022 (still under investigation)	44	15	25

Bearded dragons carry Salmonella in their droppings ~ organism spreads easily



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Salmonella outbreak – linked to animal products

Year	Reported cases	Hospitalizations	States
2012	49	10	20
2019	154	35	34

2012: Diamond Pet dog food

2019: Multidrug-resistant *Salmonella* sp, Pig ear dog treats




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Signs & Symptoms of Salmonellosis

Category	Symptoms
Humans	Diarrhea (possibly bloody), Vomiting, Fever, Abdominal cramps
Pets	Diarrhea with possible blood & mucus, Vomiting, Fever, Tired

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Diagnosis of Salmonellosis

- Stool culture
- Blood culture
- Send organism to state public health lab for serotyping
- Public health reports results to CDC for confirmation & disease-surveillance




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Other infections spread by pets

<i>Pasteurella multocida</i>	MRSA	Rabies
Tick-borne diseases	Hookworm	Toxocariasis
Cryptococcosis	Lymphocytic choriomeningitis virus (LCMV)	<i>Mycobacterium marinum</i>

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Pet Precautions

- Pick the right pet!
- Regular vet visits & up-to-date vaccinations
- Wash hands after handling pets, pet's food, or cleaning after them
- Do not feed pets raw pet food or uncooked meat
- Keep kennels and/or cages clean
- Scoop the poop!

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THANK YOU!

Thank you to the MLS students and faculty at
LSU Health Shreveport for providing me with
pictures of your pets!

NOTE: These pets are healthy 😊

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References

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