

THE HUMAN-ANIMAL BOND: HOW CLOSE IS TOO CLOSE?

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**DISCLOSURE:
SARAH PLANTE HAS
NO RELATIONSHIPS
WITH INELIGIBLE
COMPANIES.**

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LEARNING OBJECTIVES

AT THE CONCLUSION OF THIS CPE ACTIVITY, PARTICIPANTS SHOULD BE ABLE TO:

- RECOGNIZE AND DESCRIBE DIFFERENT ZOONOTIC DISEASES: RABIES, LYME DISEASE, RINGWORM (DERMATOPHYTOSIS), LEPTOSPIROSIS, GIARDIA, AND TOXOPLASMOSIS
- DESCRIBE METHOD OF TRANSMISSION OF EACH DISEASE
- LIST THE TREATMENT OF EACH DISEASE (IF POSSIBLE)
- INDICATE THE SPECIES OF ANIMAL THAT CAN HARBOR THE DISEASE
- DESCRIBE HOW TO PREVENT THE DISEASE



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RABIES

- FATAL VIRAL DISEASE, UNCURABLE
- TWO FORMS IN ANIMALS: RABIE FURIE AND DULL FORM
- RABIE FURIE: AGGRESSIVE BEHAVIOR, FOAMING AT THE MOUTH, PARALYSIS OF LIMBS OR INCOORDINATION (ALL WITH BITING)
- DULL FORM: RABIE SYMPTOMS, PARALYSIS MAY OCCUR INITIALLY IN THE LIMBS OR MAY BITES (COMMON IN CATS)
- MOST COMMON WILD RESERVOIRS = FOXES, SKUNKS, COYOTES, RACCOONS, BATS



Original Author Lindsay Stull DVM, Revised by Dr. Rothrock DVM, Rabies (Zoonotic) | (Canine) 3/2/2023
<https://www.vin.com/doc/id/4953578/#id=407c32a11bf-ecf8-401f-b02e-473a9692d340.17.120.534>

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RABIES

- MOST COMMON CAUSE IN HUMANS = DOG BITES
- HIGHEST CONCENTRATION OF VIRUS IN SALIVA, THROUGH CONTACT TRANSMITTED THROUGH OPEN WOUNDS, MUCOUS MEMBRANES, VERY RARELY AEROSOL TRANSMISSION CAN OCCUR
- NO SURVIVAL THROUGH VASCULAR RABIES, THOUGH CAN GET POST EXPOSURE TREATMENT AND CAN HELP PREVENTING FROM CAUSING DISEASE IN THE FIRST PLACE (NO ONE HAS BEEN EXPOSED TO A RABIES POSITIVE ANIMAL)
- CAN GET VACCINATED FOR RABIES, THOUGH \$\$\$

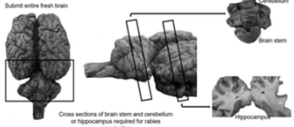


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RABIES

- BEST WAY TO "TREAT" RABIES IS TO PREVENT IT!
- VACCINATE YOUR DOGS, CATS
 - RABIES IS REQUIRED BY LAW IN DOMESTIC ANIMALS: DOGS, CATS, EVEN IF INDOORS ONLY CAT!
 - FERRETS CAN GET RABIES TOO!
 - IF YOUR ANIMAL COMES INTO CONTACT WITH ANY WILDLIFE SUSPICIOUS OF RABIES, THEY REQUIRE A BOOSTER **REGARDLESS** OF IF THEY ARE UP TO DATE OR NOT!
- HOW DO YOU KNOW IF AN ANIMAL IS POSITIVE FOR RABIES?




Submit entire fresh brain
 Cross sections of brain stem and cerebellum or hippocampus required for rabies examination

NDSU Veterinary Diagnostic Laboratory, Sample Submission Guidelines for Rabies Testing, 3/29/24
<https://www.vdl.ndsu.edu/sample-submission-guidelines-for-rabies-testing/>

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AT WHAT AGE IS THE EARLIEST A DOG OR CAT CAN RECEIVE THE RABIES VACCINATION?

A. 8 WEEKS
 B. 6 MONTHS
 C. 12 WEEKS



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LYME DISEASE

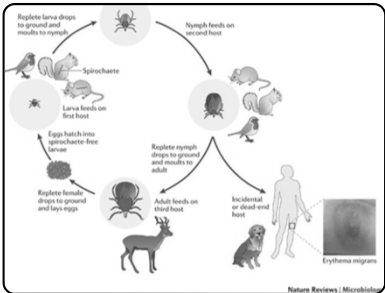
- BORRELIA BURGDORFERI, SPIROCHETE BACTERIA WITH TICK VECTOR
 - IXODES SCAPULARIS = MOST COMMON TICK VECTOR
 - LIVES IN THE SALIVARY GLANDS OF THE TICK
- CATS TEND TO BE MORE RESISTANT TO TICK DISEASES
- CAN BE VERY DIFFICULT TO REMOVE TICKS, ESPECIALLY IF THEY ARE VERY SMALL – MAKE SURE TO REMOVE THE ENTIRE HEAD!
- APPROXIMATELY 90-95% OF DOGS ARE ASYMPTOMATIC

Original Author Linda G. Shell DVM. Revised by Karl Rothrock DVM. Lyme Disease [Zoonotic] [Canine]. 3/28/24. <https://www.vin.com/doc/?id=4953582&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712025702>

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LYME DISEASE

- DOES NOT COME FROM THE DOG, BUT THE DOG CAN BRING IN TICKS THAT CAN BITE YOU!
- DOGS DO NOT GET THE TYPICAL "BULLSEYE" PATTERN LIKE HUMANS! USUALLY JUST A VERY RED, IRRITATED SPOT



Rodolf, J., Calmano, M., Stevenson, B. et al. Of ticks, mice and men: understanding the dual host lifestyle of Lyme disease spirochetes. Nat Rev Microbiol 10, 87–99 (2012). <https://doi.org/10.1038/nrmicro0214> 3/28/24.

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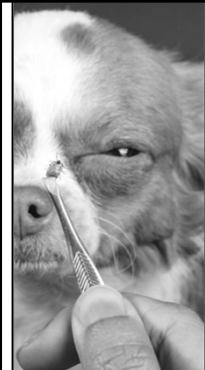
Centers for Disease Control and Prevention, <http://phil.cdc.gov/phil/>

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LYME DISEASE - TREATMENT

- TREATMENT IS DOXYCYCLINE, AT 5 MG/KG Q12H FOR 28 DAYS
- PREVENTION IS ALSO KEY!
 - MAKE SURE YOUR DOG IS UP TO DATE ON THE LYME VACCINE YEARLY— HELPS PREVENT PROTEINS (OSP A AND OSP C) FROM BINDING TO THE HOST'S CELLS (MERCK NOBIVAC)
 - FLEA AND TICK PREVENTION – YEAR-ROUND!! MULTIPLE PRODUCTS AVAILABLE: NEXGARD, NEXGARD PLUS, REVOLUTION PLUS, BRAVECTO, SIMPARICA TRIO, FRONTLINE
 - NATURAL PREVENTION: VETRISCIENCE VETRI REPEL SPRAY (LEMONGRASS OIL, CINNAMON OIL, SESAME OIL, CASTOR OIL)

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WHAT IS THE MOST COMMON SYMPTOM OF LYME DISEASE IN DOGS FIRST NOTICED BY OWNERS?

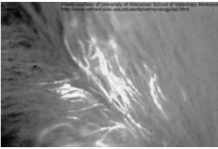
A. SHITTING LAMENESS
 B. VOMITING
 C. INCREASED THIRST AND URINATION (PUPPY)



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RINGWORM (DERMATOPHYTOSIS)

- CAUSED BY TWO SPECIES OF FUNGI: MICROSPORUM AND TRICHOPHYTON
 - M. CANIS MOST COMMON W/ CATS AND DOGS
- ANIMAL-TO-ANIMAL OR ANIMAL-TO-HUMAN CONTACT
- IMMUNE COMPROMISED OR PRE-EXISTING SKIN LESIONS – MORE LIKELY TO DEVELOP
- ITCHY? NOT ALWAYS A TYPICAL PRESENTATION ON EXAM, EITHER.
 - MOST "TYPICAL" CASES LOOK LIKE PATCHY HAIR LOSS, CAN BE CIRCULAR OR GEOGRAPHIC IN SHAPE, OFTEN TIMES SEEN AROUND EYES, FACE, EARS
- DOES NOT HAVE TO LOOK LIKE A RING ON ANIMALS! THE NAME COMES FROM ITS APPEARANCE ON HUMAN SKIN



Original Author Linda G. Shell DVM. Revised by Kathy Tater DVM and Alexandra Gould DVM. Dermatology (Zoonotic) (Feline). 3/30/24. <https://www.vin.com/doc/34456858938cid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712630982>

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RINGWORM – TREATMENT



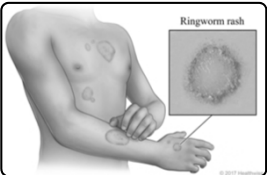
- MILD OR FOCAL CASES = MICONAZOLE CREAM OR SHAMPOO (USUALLY USED IN COMBINATION); TERBINAFIN (LAMISIL, LOTRIMIN) WORKS WELL AS A SINGLE AGENT
- IMMUNE COMPROMISED OR MORE RESISTANT CASES = ITRACONAZOLE
- ALSO MAKE SURE YOU WASH EVERYTHING THAT CAN BE IN HOT, SOAPY WATER! YOU CAN ALSO USE DILUTE BLEACH ON ITEMS THAT CAN'T BE FIT INTO A WASHER OR SINK

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RINGWORM IN HUMANS

- TYPICAL PRESENTATION
- ITCHY!!!
- PREVENTABLE
- MOST PEOPLE THAT GET RINGWORM ARE EITHER IN THE VETERINARY FIELD OR HAVE THEIR OWN PETS



Healthwise Staff. Ringworm skin rash. 3/31/24. <https://www.cigna.com/knowledge-center/hw/ringworm-skin-rash-10942>

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WHAT IS THE BEST WAY TO PREVENT MOST ZOOONOTIC INFECTIONS?




- A. AVOID WILDLIFE
- B. USE ESSENTIAL OILS
- C. WASH YOUR HANDS

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LEPTOSPIROSIS

- ANOTHER SPIROCHETE BACTERIA, TYPICALLY SHED THROUGH THE URINE OF WILDLIFE
 - DIFFERENT SPECIES OF LEPTOSPIRA: GRIPPITYPHOSA, BRATISLAVA, AUTUMNALIS, AND PONOMA
 - DOG, RAT, RACCOON, SKUNK, COW, PIG, MICE
- COMMONLY FOUND IN WARM, WET, HUMID ENVIRONMENTS: STAGNANT AND SLOW-MOVING WATER: PONDS, PUDDLES, BROOKS WITH OFFSHOOTS
- CAN CAUSE SEVERE KIDNEY AND LIVER FAILURE, OFTEN DOGS COME IN SEVERELY JAUNDICED

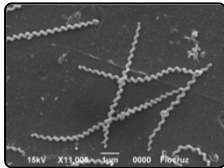


Original Author Rhea V. Morgan DVM. Revised by Karl Rothrock DVM. Leptospirosis (Zoonotic) (Canine). 3/30/24. <https://www.vin.com/doc/34449533848cid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712631608>

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LEPTOSPIROSIS – TREATMENT

- DOXYCYCLINE 5 MG/KG Q12H X 14 DAYS
- MAY NEED HOSPITALIZATION, USUALLY SIGNS ARE SEVERE WHEN DIAGNOSIS OCCURS
 - IVF W/ LRS OR NORMAL SALINE COMMON, IV DOXYCYCLINE
- GASTROPROTECTANTS, SUCH AS MAROPROFANT AT 1 MG/KG (IV/SQ) TO 2 MG/KG (PO) OR FAMOTIDINE AT 1 MG/KG (IV/SQ) TO 2 MG/KG (PO)
- SAM-E OR URSODIOL ALSO FOR HEPATIC SUPPORT
- IF THEY SURVIVE TREATMENT, MAY HAVE LINGERING KIDNEY OR LIVER DZ; MAY NEED TO CONTINUE WITH SUPPORTIVE CARE:
 - LOW PROTEIN PRESCRIPTION KIDNEY DIET (PURINA NF, HILL'S K/D, ROYAL CANIN RENAL SUPPORT)
 - DENAMARIN (SAM-E)
- PREVENTION = LEPTOSPIROSIS VACCINATION YEARLY



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LEPTO IN HUMANS

- VERY SIMILAR TO DOGS
- FEVER, FLU-LIKE SYMPTOMS, JAUNDICE
- FIRST AND SECOND PHASE
 - FIRST PHASE MORE MILD
 - SECOND PHASE MORE SEVERE – CAN END WITH KIDNEY OR LIVER FAILURE, OR EVEN MENINGITIS

CDC. Leptospirosis: Signs and Symptoms. 4/8/24. <https://www.cdc.gov/leptospirosis/symptoms/index.html>

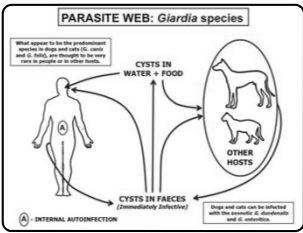
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SPIROCHETE BACTERIA ARE COMMONLY TREATED WITH WHAT ANTIBIOTIC?

- A. DOXYCYCLINE
- B. CLINDAMYCIN
- C. AMOXICILLIN-CLAVULANIC ACID

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GIARDIA

- PROTOZOAN INTESTINAL PARASITE
- NOT A WORM!
- CAN HAVE ANTIGEN PRESENT FOR 6 MONTHS POST-TREATMENT OF INFECTION
- CYSTS ARE THE INFECTIVE STAGE
- DIARRHEA OCCURS SECONDARY TO MALABSORPTION, MALDIGESTION, AND HYPERSECRETION OF FLUIDS
- CAN BE ASYMPTOMATIC

Western College of Veterinary Medicine. Giardia species. 3/31/24. <https://www.usask.ca/learnabout/parasites/parasites/giardia/species.php>

Original Author Linda G. Shell DVM. Revised by Jacqueline Brister DVM and Kari Rothrock DVM. Giardiasis (Zoonotic) (Canine). 3/30/24. <https://www.vin.com/doc/?id=4953185&pid=607c32a12bf-ecf8-4011-b02e-473a9692d340.1712632200>

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GIARDIA - TREATMENT

- TYPICALLY A COMBINATION TREATMENT OF PANACUR (FENBENDAZOLE) AND METRONIDAZOLE
- DOSAGES FOR METRONIDAZOLE VARY DEPENDING ON CLINIC; OUR DOSING IS 25 MG/KG Q24H x 7 DAYS
- FENBENDAZOLE – POWDERED GRANULES (DOSED PER LB) x5 DAYS OR 50 MG/KG Q24H x 5 DAYS FOR THE 100 MG/ML SUSPENSION

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GIARDIA IN PEOPLE



- DIARRHEA MOST COMMON SYMPTOM
- CAN BE ON/OFF FOR A LONG TIME

CDC. Giardia: Diagnosis and Treatment. 4/8/24. <https://www.cdc.gov/parasites/giardia/diagnosis.html>

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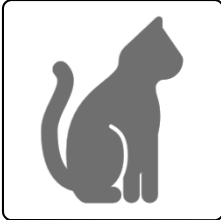
MOST ZOOONOTIC INTESTINAL PARASITES ARE SPREAD THROUGH WHAT MODE OF TRANSMISSION?

- A. AEROSOLIZED
- B. INFECTION THROUGH BREAK IN THE SKIN
- C. FECAL-ORAL

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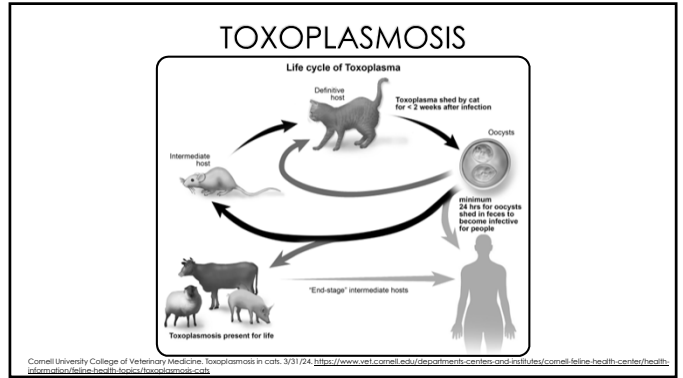
TOXOPLASMOSIS

- ANOTHER PROTOZOAL PARASITE, INTRACELLULAR IN TISSUES
- TOXOPLASMA GONDII – CATS ARE THE ONLY DEFINITIVE HOSTS, BUT CATS, DOGS AND PEOPLE CAN BE INTERMEDIATE HOSTS AS WELL
- MAIN METHOD OF INFECTION IN PEOPLE IS FECAL-ORAL
- CATS SHED THE CYSTS IN THEIR FECES, OWNERS CLEAN THEIR LITTER BOX, AND THEN EAT, DRINK, OR OTHER ACTIVITIES WITHOUT WASHING THEIR HANDS
- IMMUNOCOMPROMISED AND PREGNANT PEOPLE MOST COMMONLY AFFECTED
- CATS MOST OFTEN DISPLAY NEURO SIGNS, FEVER, ANOREXIA, RESPIRATORY SIGNS, OCULAR SIGNS



Original Author Linda G. Shell DVM. Revised by Jacqueline Brister DVM and Karl Rothrock DVM. Toxoplasmosis (Zoonotic) (Feline). 3/30/24. https://www.vin.com/doc/9id=4953474&cid=607c32a12ef-ac18-4011-b02e-473a972d3d0_1712632880

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TOXOPLASMOSIS - TREATMENT

- OFTEN TIMES MAY NEED MULTI-MODAL TREATMENT (ANTIBIOTICS + SUPPORTIVE CARE)
- CLINDAMYCIN 10-12.5 MG/KG Q12H FOR 28 DAYS = TREATMENT OF CHOICE
- TMP-SMZ (TRIMETHOPRIM-SULFAMETHOXAZOLE) 15 MG/KG Q12H, IN COMBO W/ CLINDA
- AZITHROMYCIN 10 MG/KG Q24H FOR 28 DAYS
- TREATMENT FOR UVEITIS (TOPICAL ANTIBIOTICS, TOPICAL STEROIDS), ANTI-EPILEPTICS (LEVETIRACETAM – 20-25 MG/KG Q8H; XR – 500 MG/CAT, PHENOBARBITAL – 1-3 MG/KG Q12H)

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TOXOPLASMOSIS IN HUMANS

- PREVIOUSLY CDC RECOMMENDED CHILDREN, PREGNANT WOMEN, AND IMMUNOCOMPROMISED SHOULD AVOID CATS
- NOT 100% NECESSARY ANYMORE
- JUST NEED TO KEEP SANITARY/GOOD HYGIENE
- HAVE YOUR PARTNER CLEAN THE LITTER BOX ☺

CDC. Toxoplasmosis: Treatment. 4/8/24. <https://www.cdc.gov/parasites/toxoplasmosis/treatment.html>

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WHAT ZOOONOTIC DISEASE CAUSES AN ITCHY, CIRCULAR RED LESION ON THE SKIN?

- LYME DISEASE
- RINGWORM
- LEPTOSPIROSIS

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FINAL THOUGHTS...

- PREVENTION IS KEY FOR ZOOONOTIC DISEASES
 - TREATMENT OFTEN TIMES CAN BE MORE DIFFICULT AND MORE COSTLY THAN PREVENTION
 - BUT PREVENTION IS NOT ALWAYS 100% EFFECTIVE
- HAND WASHING IS AN EFFECTIVE WAY TO PREVENT MANY ZOOONOTIC DISEASES
- MUST TAKE INTO CONSIDERATION WILDLIFE IN OUR OWN YARDS

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