



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

DR. SARAH N. PLANTE, DVM

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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 ZOOBOTIC 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, LYSSAVIRUS
- TWO FORMS IN ANIMALS: RAGE FORM AND DULL FORM
- RAGE FORM → AGGRESSIVE BEHAVIOR, FOAMING AT THE MOUTH, SNARPING AT INANIMATE OBJECTS OR NOTHING AT ALL ("FLY BITING")
- DULL FORM → PARALYSIS, DELAYED REFLEXES, PARALYSIS MAY EVEN OCCUR INITIALLY IN THE LIMB THAT WAS BITTEN (COMMON IN CATS)
- MOST COMMON WILDLIFE RESERVOIRS = FOXES, SKUNKS, COYOTES, RACOONS, BATS

Original Author Linda G. Shell DVM. Revised by Karl Rothrock DVM. Rabies (Zoonotic) (Canine). 3/28/24.  
<https://www.vin.com/doc/?id=4953578&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712025361>

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## RABIES

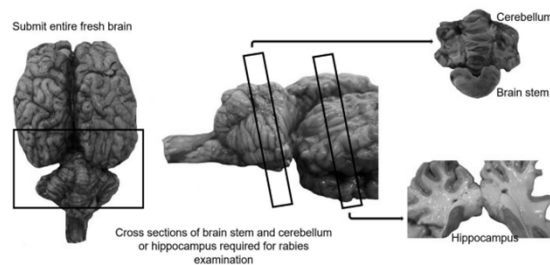
- MOST COMMON CAUSE IN HUMANS = DOG BITES
- HIGHEST CONCENTRATION OF VIRUS IS IN SALIVA, THOUGH CAN BE TRANSMITTED THROUGH OPEN WOUNDS IF IN CONTACT WITH SALIVA; VERY RARELY AEROSOL TRANSMISSION CAN OCCUR
- NO CURE IF PERSON CONTRACTS RABIES, THOUGH CAN GIVE POSTEXPOSURE INJECTIONS THAT CAN PREVENT THE VIRUS FROM CAUSING DISEASE IN THE CASE THAT SOMEONE 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?



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

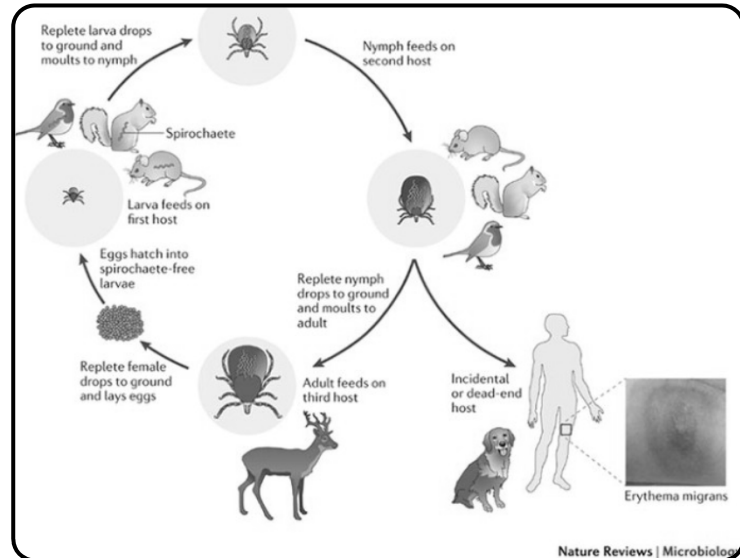
Original Author Linda G. Shell DVM. Revised by Kari Rothrock DVM. Lyme Disease (Zoonotic) (Canine). 3/28/24.  
<https://www.vin.com/doc/?id=4953582&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712025702>

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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


Radolf, J., Caimano, M., Stevenson, B. et al. Of ticks, mice and men: understanding the dual-host lifestyle of Lyme disease spirochaetes. *Nat Rev Microbiol* 10, 87–99 (2012). <https://doi.org/10.1038/nrmicro2714> 3/28/24.



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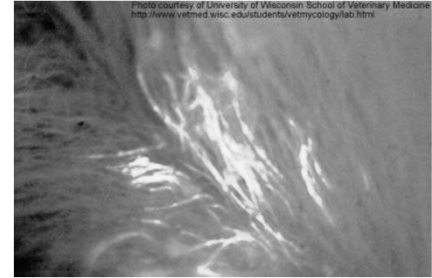
## WHAT IS THE MOST COMMON SYMPTOM OF LYME DISEASE IN DOGS FIRST NOTICED BY OWNERS?

- A. SHIFTING LAMENESS
- B. VOMITING
- C. INCREASED THIRST AND URINATION (PUPD)

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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. Dermatophytosis (Zoonotic) (Feline). 3/30/24. <https://www.vin.com/doc/?id=5685893&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712630982>

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## RINGWORM – TREATMENT

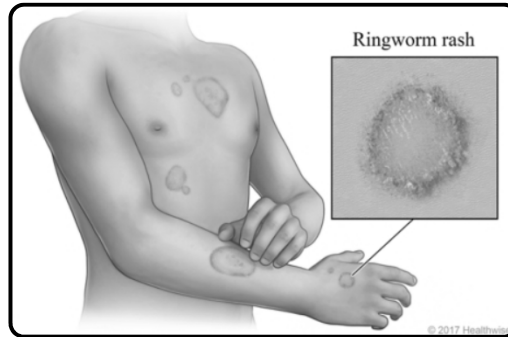
- MILD OR FOCAL CASES = MICONAZOLE CREAM OR SHAMPOO (USUALLY USED IN COMBINATION); TERBINAFINE (LAMISIL, LOTRIMIN) WORKS WELL AS A SINGLE AGENT
- IMMUNE COMPROMISED OR MORE RESISTANT CASES = ITRACONAZOLE
- ALSO MAKE SURE YOU WASH EVERYTHING THAT CAN BE IN HOT, SOAPY WATER! YOU CAN ALSO USE DILUTE BLEACH 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-tp10942>

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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: GRIPPOTYPHOSA, 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

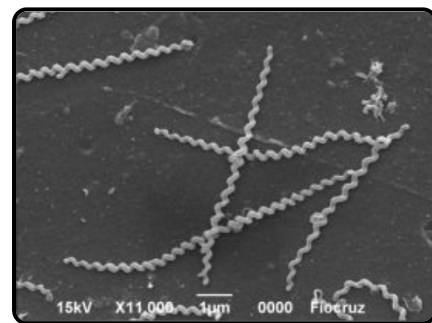


Original Author Rhea V. Morgan DVM. Revised by Kari Rothrock DVM. Leptospirosis (Zoonotic) (Canine). 3/30/24.  
<https://www.vin.com/doc/?id=4953584&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712631608>

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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 MAROPITANT 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>

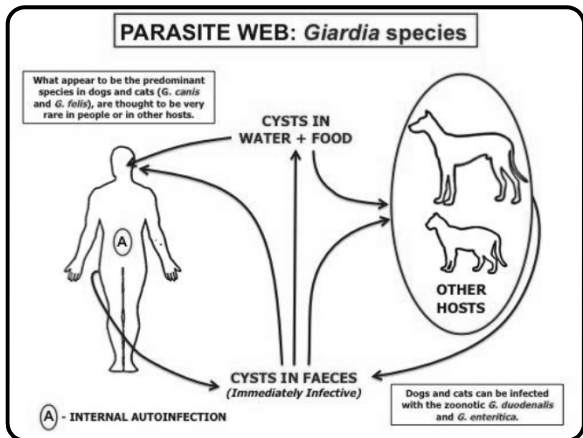
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## SPIROCHETE BACTERIA ARE COMMONLY TREATED WITH WHAT ANTIBIOTIC?

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

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## GIARDIA

- PROTOZOAL 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://wcv.m.usask.ca/learnaboutparasites/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-ecf8-401f-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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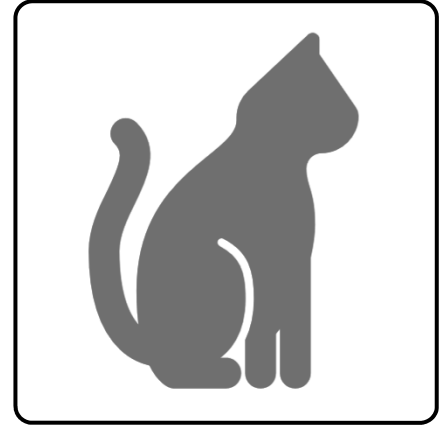
MOST ZOOONOTIC INTESTINAL PARASITES ARE SPREAD THROUGH WHAT MODE OF TRANSMISSION?

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

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## TOXOPLASMOSIS

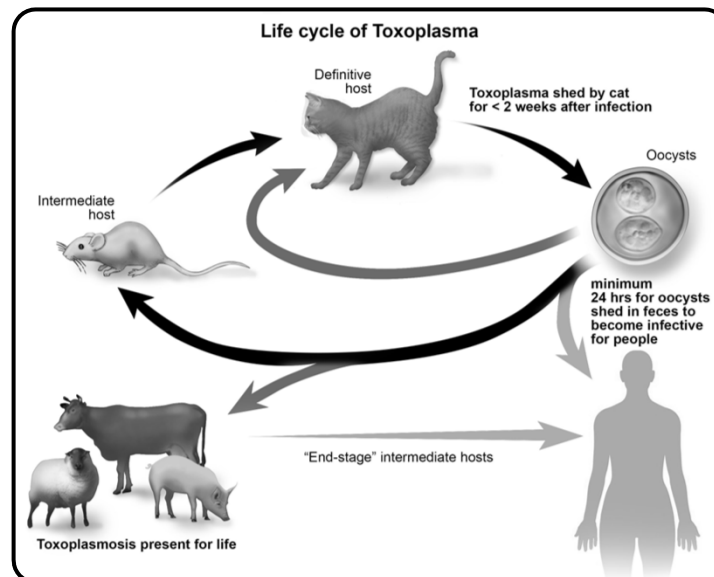
- ANOTHER PROTOZOAL PARASITE, INTRACELLULAR IN TISSUES
  - TOXOPLASMA GONDII – CATS ARE THE ONLY DEFINITIVE HOSTS, BUT CATS, DOGS AND PEOPLE CAN BE INTERMEDIATE HOSTS AS WELL
- MAIN METHOD OF INFECTION IN PEOPLE IS FECAL-ORAL
  - CATS SHED THE CYSTS IN THEIR FECES, OWNERS CLEAN THEIR LITTER BOX, AND 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 Kari Rothrock DVM. Toxoplasmosis (Zoonotic) (Feline). 3/30/24. <https://www.vin.com/doc/?id=4953474&pid=607c32a12bf-ecf8-401f-b02e-473a9692d340.1712632880>

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## TOXOPLASMOSIS



Cornell University College of Veterinary Medicine. Toxoplasmosis in cats. 3/31/24. <https://www.vet.cornell.edu/departments-centers-and-institutes/cornell-feline-health-center/health-information/feline-health-topics/toxoplasmosis-cats>

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

- A. LYME DISEASE
- B. RINGWORM
- C. LEPTOSPIROSIS

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## FINAL THOUGHTS...

- PREVENTION IS KEY FOR ZOONOTIC 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 ZOONOTIC DISEASES
- MUST TAKE INTO CONSIDERATION WILDLIFE IN OUR OWN YARDS

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QUESTIONS?