Vet 433A Tick-Borne Diseases

Disease	Tick and Geographic Location	Pathogenesis	Clinical Signs	Diagnosis / Treatment
Lyme	*Ixodes pacificus* (Western Blacklegged Tick) *Ixodes scapularis* (Blacklegged Tick) Adults: large mammals (deer) Larvae and Nymphs: Small mammals, birds, lizards 90% of cases in the USA are in the northeast The remainder are in the upper Midwest	*Borrelia burgdorferi* *Ixodes* ticks are infected after feeding on the white-footed mouse (*Peromyscus leucopus*) Western Grey Squirrels in Cali Nymphs are more likely to transmit infection since they are small and engorge quickly Saliva-assisted transmission Transmit after 24h	Erythema migrans in humans 95% of infected dogs do not show signs Neutrophilic polyarthritis 2-5 months after infection Protein-losing nephropathy Thrombocytopenia	Organism detection tests are not useful Serology C6 (VlsE segment) expressed only during natural infection Antibodies from 3-4 weeks OspA always expressed OspC tick salivary gland Vx works in the tick and completely blocks transmission of dz Doxycycline 4 weeks amoxicillin Cefovecin 8mg/kg sq 2 doses 14 days apart Don't treat seropositive healthy dogs
Granulocytic anaplasmosis	*Ixodes pacificus* (Western Blacklegged Tick) *Ixodes scapularis* (Blacklegged Tick) Adults: large mammals (deer) Larvae and Nymphs: Small mammals, birds, lizards	*Anaplasma phagocytophilum* Upper Midwest, northeast, CA, OR, and Europe Same vector as *Borrelia burgdorferi* and is often co-transmitted	Fever, lethargy, lymphadenopathy, splenomegaly, scleral injection Lameness- neutrophilic polyarthritis? Thrombocytopenia, mild anemia, neutropenia/neutrophilia,	Organism detection test: Morulae within granulocytes Antibody detection tests are **not** very useful for diagnosis

			lymphopenia, hypoalbuminemia, elevated ALP	Response to treatment **5m/kg PO q12h for 2 weeks**
Canine Monocytic Ehrlichiosis	*Rhipicephalus sanguineus* Everywhere in US Mainly SE and SW states Can survive indoors	*Ehrlichia canis* Unique acute, subclinical, and chronic phases Acute: multiplies in monocytes with splenomegaly and lymphadenopathy	Acute Fever, anorexia, depression, weight loss, oculonasal discharge, lymphadenopathy, splenomegaly Peripheral edema, neuro signs Thrombocytopenia +/- mild leukopenia and anemia Subclinical (6-9 weeks post-infect, lasts years) No signs +/- thrombocytopenia Chronic phase Small % of infected dogs Impaired marrow function and pancytopenia Pallor, bleeding tendencies, weight loss, debilitation, anterior uveitis, retinal hemorrhage, neuro signs, secondary infections	Morlulae (mostly acute phase) Hyperplastic or hypoplastic marrow Polyclonal or rarely monoclonal gammopathy +/- protein-losing nephropathy Organism detection: PCR panels best for acute phase Antibody detection tests Lack sensitivity early on Cross-reactivity with *Ehrlichia* species Widespread subclinical exposure problematic Rare false negatives in chronically infected dogs **Doxycycline 5mg/kg PO q12h 6-8 weeks**
Rocky Mountain Spotted Fever	*Rhipicephalus sanguineus* *Dermacentor variabilis* Everywhere in US	*Rickettsia rickettsii* Not common in California Seasonal dz	Vasculitits, necrosis, increased vascular permeability	Hard to distinguish from acute ehrlichiosis but SHORT course

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	Can survive indoors	Ticks attach for 5-10 h Endothelial cells are infected Incubation period 2-14 days	Edema, hemorrhage, hypotension, shock Fever, anorexia, depression, edema, hyperemia, necrosis of extremities Mucopurulent ocular discharge, vomiting, diarrhea Neuro signs, resp. signs, joint pain and swelling, muscle pain, cardiac arrhythmias, bleeding, thrombosis Hypoalbuminemia, elevated liver enzymes, thrombocytopenia Permanent CV, renal and neuro damage possible	Dead or better in 2 weeks Acute and convalescent phase titers IFA No POC tests Doxycycline 5mg/kg q12h x 2 weeks Usually see improvement within 1-2 days Lifelong immunity following natural infection Dogs are a sentinel for human disease
Babesia vogeli	*Rhipicephalus sanguineus* Everywhere in US Can survive indoors			
Cyclic thrombocytopenia	*Rhipicephalus sanguineus* Everywhere in US Can survive indoors			
Tularemia	*Dermacentor variabilis*			
Colorado Tick Fever	*Dermacentor andersoni*			
Human monocytic Ehrlichiosis	*Amblyomma*	Human monocytic ehrlichiosis	Dogs can be exposed and infected Febrile illness experimentally	

			Clinical significance unclear	
Canine Granulocytic Ehrlichiosis	*Amblyomma*			
Rickettsia spp. (RMSF-like disease)	*Amblyomma*			
Feline Cytauxzoonosis	*Amblyomma*			
Canine American Hepatozoonosis	*Amblyomma*			

Rickettsiae

- Arthropod-transmitted
- Gram-negative pleomorphic BACTERIA
  Coccobacilli
- Obligately intracellular, may form morulae
- *Ehrlichia spp. Anaplasma spp. Rickettsia spp. Neorickettsia spp.*
- "Doxycycline-deficiency disease"