

Appendix 1 (as supplied by the authors): Spirochetal infections and other tick-borne febrile illnesses in Canada^a

	*Tick Borne Relapsing Fever^{1,2}	*Louse Borne Relapsing Fever³	Leptospirosis^{4,5}	Lyme disease^{6,7}	Rocky Mountain Spotted Fever^{8,9}
Causative agent	<i>Borrelia hermsii</i>	<i>Borrelia recurrentis</i>	<i>Leptospira</i> spp. (eg. <i>L. interrogans</i>)	<i>Borrelia burgdorferi</i>	<i>Rickettsia rickettsii</i>
Arthropod vector	Ornithodoros spp. ticks (Argasid ticks, “soft ticks”)	<i>Pediculus humanus</i> (human body louse)	None	Ixodes ticks (scapularis on East coast, pacificus on West coast)	<i>Dermacentor andersoni</i> (Rocky Mountain Wood Tick) in Canada
Animal reservoir	Small mammals: mice, rats, squirrels, chipmunks	None	Rodents, small mammals. Can also infect livestock, dogs and cats.	East coast: White-footed mice, chipmunks, white-tailed deer. West coast: deer mice, wood rats	None

Appendix to: Hussein H, Showler A, Tan DHS. Canadian “cabin fever”: tick-borne relapsing fever in pregnancy. *CMAJ* 2013; DOI:10.1503/cmaj.122053.

Copyright © 2014 The Author(s) or their employer(s).

To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca

<p>Geographic distribution in Canada</p> <p>and</p> <p>risk factors for acquisition</p>	<p>Southern British Columbia</p> <p>Exposure to rustic housing with rodent infestations</p>	<p>No North American outbreaks since 19th century.</p> <p>Occurs in epidemics in populations with poor hygiene.</p>	<p>Limited data in Canada.</p> <p>Few cases associated with direct occupational exposure to urine of infected animals: veterinarians, butchers, hunters, any animal handlers.</p> <p>Cases in returning travellers from tropical and subtropical areas with indirect exposure to wet soil or water, often following floods or fresh-water sports.</p>	<p>Southern parts of Quebec, New Brunswick, Nova Scotia, Ontario, Manitoba and British Columbia</p> <p>Exposure to wooded areas, periurban areas.</p> <p>Occasional transmission in urban centers.</p>	<p>Southeastern Alberta, Southwestern Saskatchewan, Southern British Columbia</p> <p>Exposure to wooded areas, periurban areas.</p> <p>Occasional transmission in urban centers.</p>
<p>Clinical clues</p>	<p>Recurrent paroxysmal fever associated with nausea, myalgias, and headache with asymptomatic periods between febrile episodes.</p>	<p>Similar to TBRF but longer fever episodes. Typically 1 relapse only. More likely to have hemorrhagic complications.</p>	<p>Fever, myalgias (calves, low back), headache, conjunctival suffusion</p> <p>Weil's disease – hepatorenal failure, hemorrhage, pneumonitis</p>	<p>Early infection:</p> <p>Erythema migrans rash, malaise, fever, fatigue, myalgias.</p> <p>Can present with arthralgias, heart block, and neurologic symptoms including bell's palsy.</p>	<p>Fever, headache.</p> <p>Maculopapular rash beginning on wrists and ankles, spreading to palms and soles and then to entire body.</p>

Diagnostic tests of choice	Peripheral blood smear during febrile episode (spirochetes observed on light microscopy using Wright-Giemsa stain or dark field microscopy). Borrelia PCR	Peripheral blood smear during febrile episode (numerous spirochetes observed on light microscopy using Wright-Giemsa stain or dark field microscopy). Borrelia PCR	Leptospira PCR (blood, urine) Serology is test of choice but not useful in early disease	Epidemiologic history and clinical presentation are mainstay of diagnosis. Serology (ELISA followed by Western blot) helpful in certain circumstances.	Skin biopsy examination with direct immunofluorescence PCR for <i>R. rickettsii</i> on blood or skin biopsy. Serologic testing not helpful in early disease
-----------------------------------	--	---	---	--	---

^a Excluding *Treponema pallidum*, the causative agent of syphilis

* Organisms can be observed under light microscopy using a Wright-Giemsa stain

¹ Center for Disease Control and Prevention. Tick-borne relapsing fever: information for clinicians [homepage on the internet].

C2012 [updated 2012 Mar 13; cited 2012 Dec 7]. Available from: <http://www.cdc.gov/relapsing-fever/clinicians/>

² Dworkin MS, Schwan TG, Anderson DE Jr. Tick-borne relapsing fever in North America. *Med Clin North Am* 2002;86:417–

33, viii–ix

³ Raoult D, Roux V. The Body Louse as a Vector of Reemerging Human Diseases. *Clin Infect Dis* 1999;29:888-911

⁴ Brown K, Prescott J. Leptospirosis in the Family Dog: a public health perspective. *CMAJ* 2008;178(4):399-401

⁵ Mandell GL, Bennett JE, Dolin R. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Disease. 7th ed.

Philadelphia: Churchill Livingstone; 2009.

⁶ Ogden NH, Lindsay LR, Morshed M, et al. The emergence of Lyme disease in Canada. *CMAJ* 2009;180(12):1221-1224

⁷ Wormser GP, Raymond RJ, Shapiro ED, et al. The Clinical Assessment, Treatment and Prevention of Lyme Disease, Human

Granulocytic Anaplasmosis, and Babesiosis: Clinical Practice Guidelines by the Infectious Diseases Society of America. *Clin Infect Dis* 2006;43:1089-134

⁸ Alberta Health. Public Health Notifiable Disease Management Guidelines – Rickettsial Infections [document on the internet]. Jan 2013 [cited 2013 Apr 13]. Available from: <http://www.health.alberta.ca/documents/Guidelines-Rickettsial-Infections-2013.pdf>

⁹ Duncan JH. Rocky Mountain Spotted Fever in Canada. *CMAJ* 1937;37(6):575-577