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May 20, 2021

Dear Colleague:

Re: TICKBORNE INFECTIONS IN MANITOBA

Tick season has arrived in Manitoba. Blacklegged ticks, the primary vector of the three reportable tick-borne diseases (Lyme disease, Anaplasmosis, and Babesiosis), are established throughout much of southern Manitoba wherever suitable tick habitat is found. Taking a complete exposure history (re: suitable tick habitat) is critical as nearly 2/3rds of tick-borne disease (TBD) cases have no recollection of a tick bite. Incidence rates of TBDs, notably Anaplasmosis and Lyme disease (LD), continue to rise. **LD is considered endemic in southern Manitoba and as a result, we are advising that post-exposure prophylactic antibiotic therapy can be considered for the prevention of LD.**

Post-exposure prophylactic antibiotic therapy can be considered within 72 hours of tick removal for **asymptomatic** adults and children if the following four criteria are met:

- Tick can be **reliably identified as an adult or nymph blacklegged tick** (*Ixodes scapularis* – see www.etick.ca for images); and
- Tick was **attached for ≥ 36 hours** or tick is engorged; and
- Tick **acquired from a high risk area** (defined as anywhere in southern Manitoba (south of the 53rd parallel) with suitable tick habitat); and
- **Doxycycline is not contraindicated**.

Diagnostic testing of asymptomatic patients following a tick bite is not recommended.

Monitor for signs and symptoms consistent with Lyme disease for 30 days.

Management of TBD:
Early treatment improves outcomes, so when early Lyme disease is suspected, treatment should be initiated on clinical suspicion of disease, without waiting for laboratory confirmation. Additionally, patients may present at any stage of LD and it is important to consider co-infections. Those with co-infections may present with more severe illness that may require multiple different therapies. Consultation with an infectious diseases specialist is recommended for patients presenting with disseminated or late LD, those with possible co-infections, and those with symptoms of other known or emerging TBDs (e.g. *Borrelia miyamotoi*, *Borrelia mayonii*, or Powassan virus). Patients with complex presentations may also be referred to the Tick Collaborative Care Service (https://wrha.mb.ca/tick-collaborative-care-service/). For a summary of Tick-borne Disease laboratory and treatment information, including Lyme disease, Anaplasmosis and Babesiosis, refer to the Tick-Borne Disease Quick Reference (attached).

Tick Surveillance:
Lastly, we would like to bring awareness to Manitoba's new eTick program. Manitobans can submit a picture to eTick for identification of the tick species they found. This allows Manitobans to confirm whether the tick they found belongs to a species capable of transmitting TBDs and allows for surveillance of the tick population. To submit a photo, visit https://www.etick.ca/ or use the free mobile app.

Sincerely,

"Original signed by"

Richard Baydack, PhD
Director
Communicable Disease Control

"Original signed by"

Santina Lee, MD FRCPC
Medical Officer of Health
Communicable Disease Control

TICK-BORNE DISEASE QUICK REFERENCE

Disease	Incubation Period	Presentation	Laboratory Investigation	Initial Treatment
Anaplasmosis	5 to 21 days	• Acute onset of fever, chills, headache, arthralgia, nausea and vomiting often in association with leukopenia, thrombocytopenia and/or elevated liver enzymes. • Severe manifestations are rare, though more common in older patients (> 60 years of age) and those with co-morbidities.	• Serological evidence of a 4-fold change in specific IgG antibody titre in paired serum samples (2 - 4 weeks apart), **OR** • Detection of DNA in a clinical specimen by specific PCR.	• Doxycycline 100mg PO BID for 2 weeks, unless contraindicated.

Babesiosis	1 to 6 weeks (*may be up to 6 months following transfusion with infected blood products*)	• Can be life threatening, particularly in older adults (> 50 years of age) and those with co-morbidities.
		• Gradual onset of malaise and fatigue accompanied by intermittent fever. Additional symptoms may include: chills, drenching sweats, anorexia, headache, myalgia, nausea, non-productive cough, arthralgia and generalized weakness.
		• Severe manifestations can include: acute respiratory distress syndrome, disseminated intravascular coagulation, hemodynamic instability, congestive heart failure, renal failure, hepatic compromise, myocardial infarction, severe hemolysis, splenic rupture and death.
			• Detection of parasites in blood smear by microscopy, **OR**
			• Detection of DNA in whole blood specimen by specific PCR.
			• Serological evidence is supportive if specific IgG antibody titre of ≥ 1:256.
			  • 4-fold rise in specific IgG antibody titre between acute and convalescent sera confirms recent infection.
			  • Titres ≥ 1:1024 suggest recent or active infections, those ≤ 1:64 suggest previous infection.
				• Mild to moderate disease: combination therapy with azithromycin and atovaquone **OR** clindamycin and quinine for 7 - 10 days.
				• Severe disease: combination therapy with clindamycin and quinine. Duration depends on clinical course.
				• Consultation with infectious diseases is strongly recommended for suspected clinical cases.

Lyme disease (LD)	**Symptoms, incubation period, laboratory diagnostics and treatments vary depending on the stage**			
	Post-exposure prophylaxis – within 72 hours of tick removal	Asymptomatic adults/children when the following criteria are met: 1) Tick reliably identified as an adult or nymph blacklegged tick (*Ixodes scapularis*), and 2) Tick was attached for ≥ 36 hours or tick is engorged, and 3) Tick acquired from a high risk area (anywhere in southern Manitoba (south of the 53rd parallel) with suitable habitat), and 4) Doxycycline is not contraindicated.	• Diagnostic testing of asymptomatic patients following a tick bite is not recommended.	• > 12 years: Doxycycline 200 mg PO x 1; • 8 - 12 years: Doxycycline 4 mg/kg (maximum 200 mg) PO x 1; • Unless contraindicated.
	Early localized LD – 3 to 30 days	• Erythema migrans (EM) or non-specific flu-like symptoms (i.e. fatigue, fever, headache, mildly stiff neck, arthralgia or myalgia and lymphadenopathy).	• Acute & convalescent sera are recommended (3 - 4 weeks apart). • Serological tests may be negative within first 6 weeks of infection. • Individuals treated early in the infection may not seroconvert and never meet Western Blot positivity criteria.	• Doxycycline 100mg PO BID for 2 - 3 weeks, unless contraindicated.
	Early disseminated LD – days to months	• Multiple EM, CNS (lymphocytic meningitis, and rarely, encephalomyelitis) & PNS (radiculopathy, cranial neuropathy, and mononeuropathy multiplex) or cardiac (intermittent atrioventricular heart block, myoepicarditis) symptoms.		• Same as early localized LD oral regimen, **OR** • Ceftriaxone 2g IV for 2 - 3 weeks for those with neuro or cardiac symptoms.
	Late LD – months to years	• Intermittent recurring arthritis (usually monoarticular) or neurological symptoms.	• A single sera sample is sufficient.	• Doxcycline 100mg PO BID for 4 weeks, **OR** • Ceftriaxone 2g IV for 2 - 4 weeks.

- **Treatment should be initiated based on clinical suspicion of disease**. Depending on symptoms and timing of diagnosis, some cases may require a longer or repeat course of treatment. Where above treatments are contraindicated consult the communicable disease management protocols available at www.gov.mb.ca/health/publichealth/cdc/tickborne/index.html for additional options.
- **Co-infection should be considered if there is a more severe clinical presentation, if symptoms persist or there is a poor response to recommended therapies.** Consider consultation with an infectious diseases specialist.
- Additional resources include:
  - https://www.cps.ca/en/documents/position/lyme-disease-children
  - https://www.idsociety.org/practice-guideline/lyme-disease/

Tick-borne disease Laboratory Diagnosis
Quick Reference for Health Care Providers

Reportable tick-borne infections

Note: *Cadham Provincial Laboratory (CPL) will only screen for organisms selected on the general requisition form. As co-infection with TBDs is possible, health care providers should select and indicate all infectious organisms for which testing is required (e.g. Lyme Ab, A. phagocytophilum and B. microti). If not listed use the 'other tests or requests' box.*

Anaplasmosis:

Includes direct and indirect detection. For the former, care providers may send a minimum 5ml EDTA whole blood (purple-topped tube) at room temperature to CPL for microscopy and PCR **BEFORE** antibiotics are given. It is recommended that a serum sample (clotted blood; red-topped tube) be sent to CPL at the same time for *Anaplasma* serology.

Babesiosis:

Includes direct and indirect detection. For the former, care providers may send minimum 5 ml EDTA whole blood (purple-topped tube) at room temperature to CPL for microscopy and PCR **BEFORE** antibiotics are given. It is recommended that a serum sample (clotted blood; red-topped tube) be sent to CPL at the same time for *Babesia* serology.

Lyme disease:

It is recommended that a serum sample (clotted blood; red-topped tube) be sent to CPL at the same time for Lyme serology **BEFORE** antibiotics are given. Providers are also encouraged to consider skin biopsy, where applicable, for Lyme PCR. The latter works best when done before institution of antibiotics and from the leading edge of the EM rash.

Emerging tick-borne infections

Note: *For emerging tick-borne infections, clinical presentation should support diagnostic requests. Consultation with infectious disease and the CPL (see below) is recommended.*

***Borrelia miyamotoi* and *Borrelia mayonii*:**

Includes direct detection only. Care providers may send minimum 5 ml EDTA whole blood (purple-topped tube) at room temperature to CPL for *Borrelia* species PCR **BEFORE** antibiotics are given. Both *B. miyamotoi* and the newly described *B. mayonii* may be detected by PCR.

Powassan virus lineage II (Deer Tick virus):

Includes direct and indirect detection. Care providers may send minimum 5 ml EDTA whole blood (purple-topped tube) at room temperature to CPL for Powassan virus/Deer tick virus RT-PCR. It is recommended that a serum sample (clotted blood; red-topped tube) be sent to CPL at the same time for Powassan virus/ Deer tick virus serology.

Additional information regarding tick-borne disease laboratory testing (selection and interpretation) may be obtained by contacting the CPL Serology section Clinical Microbiologist at (204) 945-7545.