



TO: Chair and Members of the Board of Health

FROM: Graham L. Pollett, MD, FRCPC
Medical Officer of Health

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LYME DISEASE SURVEILLANCE AND PROMOTIONAL ACTIVITIES IN MIDDLESEX-LONDON

Recommendation

It is recommended that the Board of Health endorse the ongoing Lyme Disease surveillance and promotional activities in Middlesex-London as outlined in Report No. 102-11.

Clinical information

Lyme disease is caused by a bacteria called *Borrelia burgdorferi*. It is transmitted to humans from the bite of an infected tick. The tick which carries this infection in Central and Eastern North America is called *Ixodes scapularis* (also called the blacklegged or deer tick). To spread infection, the tick must remain attached to the person for at least 24 hours. The symptoms of the infection generally start within 3 to 30 days of a tick bite and consist of a distinctive “bull’s-eye” rash in the area of the bite. The bull’s-eye rash, also called erythema migrans, expands to more than 5 cm in diameter. The rash is present in 70 to 80% of Lyme disease infections and is accompanied by non-specific symptoms such as tiredness, fever, headache, and joint and muscle pain. If untreated, the second stage of the disease can develop which includes symptoms affecting the nervous system, joints and heart and can cause skin rashes, fatigue and weakness. If the second stage is left untreated, it can progress to the third stage which involves joint and neurologic problems.

Lyme disease is treated with antibiotics and is rarely fatal. In the early stages, the antibiotics are given by mouth for 14 days; later stages of the infection may require longer courses of treatment or treatment given by the intravenous route. A condition called “Post-Treatment Lyme Disease Syndrome” occurs in approximately 10-20% of patients who have been successfully treated for Lyme disease; symptoms can include muscle and joint pains, cognitive complaints such as difficulty with memory or concentration, sleep disturbance, or fatigue that can last for months. These symptoms generally gradually resolve and do not require further treatment. “Chronic Lyme Disease” is an inappropriate term used to describe non-specific symptoms, often in people who have not been confirmed to have a Lyme disease infection.

Endemic Areas for Lyme disease

The *Ixodes scapularis* tick, which transmits the Lyme disease bacteria, can routinely be found in specific geographic locations in North America. In Canada, Lyme disease from these ticks is a particular risk in southeastern Quebec, southern and eastern Ontario, southeastern Manitoba and parts of New Brunswick and Nova Scotia. In Ontario, there are seven locations which are known to be endemic for Lyme disease (meaning the *Ixodes scapularis* tick is established in these areas and the ticks have been found to be infected with the *Borrelia burgdorferi* bacteria). These areas are: Long Point Provincial Park, Turkey Point Provincial Park, Rondeau Provincial Park, Point Pelee National Park, Prince Edward Point National Wildlife Area, Wainfleet Bog Conservation Area, and the St. Lawrence Island National Park.

Passive and active surveillance are used to determine if an area is endemic for Lyme disease. Passive surveillance involves testing ticks that are found on and submitted by residents. Ticks are tested to determine if they are *Ixodes scapularis*, and if found to be this tick, they are then tested at the National Microbiology Laboratory to determine if they carry the *Borrelia burgdorferi* bacteria. In geographic areas that are the source

of multiple tick submissions or human cases of Lyme disease, active tick surveillance may be conducted. This consists of dragging the area to find and identify ticks and/or testing small mammals for the presence of ticks.

Lyme disease occurs most commonly in endemic areas. Occasionally, infected ticks can be spread by migratory birds on which the ticks feed, so it is possible, but rare, to acquire Lyme disease while in non-endemic areas.

Testing for Lyme Disease in Humans

Testing for Lyme disease in humans must be done by an accredited laboratory. In Ontario, this testing is performed by the Public Health Ontario Laboratories using well established guidelines. In 2010, over 13,000 specimens were submitted to the Public Health Ontario Laboratories for Lyme disease testing, which is a significant increase from the approximately 4,000 tests submitted in 2003.

The testing method used by the Public Health Ontario Laboratories is referred to as a “two-tiered” algorithm. Using this method, a first test is done (called an enzyme-linked immunosorbent assay or ELISA). If this test is found to be positive, a second more specific test (called a Western Blot) is done to confirm the diagnosis. Using this methodology, 95 people in Ontario were diagnosed with Lyme disease in 2010 for a rate of 0.72 per 100,000 residents. This has increased from 2001 when 24 people were diagnosed with Lyme disease. This increase may be attributed to increased Lyme disease activity in the province, as well as enhanced awareness of the condition leading to more testing and diagnosis. Rates of Lyme disease are considerably higher in the United States with approximately 30,000 confirmed and probable cases diagnosed in 2010 for a rate of 7.3 confirmed cases per 100,000 people. Twelve states (mainly the northeast / mid-Atlantic and upper mid-western states) account for approximately 94% of the cases.

There are several limitations to Lyme disease testing which include the following:

- The first test may not be positive early in the course of infection;
- The first test may never become positive if the infection is treated early;
- The first and second test may be erroneously positive in people with other infections or conditions.

To overcome these limitations in testing, it is essential to consider the clinical symptoms and history of exposure to ticks when making the diagnosis. In some instances, repeat testing may be indicated several weeks later. Testing for Lyme disease should be done only when there are symptoms suggestive of the infection and/or a known tick exposure; testing should not be done for non-specific symptoms.

Lyme Disease in Middlesex-London

Middlesex-London is not a Lyme disease endemic area. Tick surveillance is conducted for Lyme disease using passive surveillance. In 2009, 17 ticks were submitted for testing; in 2010, 46 ticks were submitted and as of November 7, 2011, 73 ticks were submitted. Ticks are first tested at the Health Unit’s Strathroy Laboratory and then submitted to the Provincial Public Health Laboratory. In total, four ticks were determined to be *Ixodes scapularis*, all of which were acquired outside of Middlesex-London. Two of the four ticks tested positive for the *Borrelia burgdorferi* bacteria. In 2011, six tick drags have also been conducted in Middlesex-London; no *Ixodes scapularis* ticks have been identified using this active surveillance method. With respect to human cases of Lyme disease, five cases have been diagnosed among residents of Middlesex-London since 2002 (1 in 2009, 3 in 2010 and 1 in 2011). All five cases were acquired during travel outside of Middlesex-London.

Prevention of Lyme disease

Although the risk of Lyme disease in Middlesex-London is very low, the Health Unit provides education to the public regarding Lyme disease prevention such as how to avoid tick bites, how to check for ticks after outdoor exposure, how to remove ticks that are found on a person and how to submit them to the Health Unit for testing. The education is often done in conjunction with education regarding West Nile Virus prevention. Appendix A is an educational brochure used by Health Unit staff to disseminate Lyme disease information to

Middlesex-London residents. Other promotional activities include a Lyme disease television commercial that ran on Rogers TV, an advertisement in the City of London's 2010 and 2011 garbage collection calendar, and bus shelter advertisements throughout the City of London. Information on Lyme disease has also been provided to health care providers in Middlesex-London. Appendix B is an Ontario Ministry of Health and Long-Term Care information sheet that was distributed to health care providers in Middlesex-London.

Plans for 2012 include continued passive surveillance for ticks as well as active tick surveillance if indicated, continued education of the public with regard to Lyme disease prevention, particularly when traveling to Lyme disease endemic areas, and updates for health care providers with regard to Lyme disease diagnosis and treatment.

This report was prepared by Dr. Bryna Warshawsky, Associate Medical Officer of Health; Mr. Jeremy Hogeveen, Vector Borne Disease Coordinator; Ms. Amy Pavletic, Public Health Inspector; Ms. Cathie Walker, Manager, Infectious Disease Control Team; Mr. Iqbal Kalsi, Manager, Environmental Health and Mr. Wally Adams, Director, Environmental Health and Chronic Disease Prevention.

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<p>This report addresses the following requirement(s) of the Ontario Public Health Standards: Infectious Disease Prevention and Control</p>
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