09/11

New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction

Welcome to the third edition of the *New Brunswick Disease Watch Bulletin* in 2011. In this issue we look at the burden of unintentional injuries in Atlantic Canada and New Brunswick and injury prevention strategies. There is an update on recent outbreaks of infections caused by pathogenic *E.coli* O157:H7 and other serotypes, including a large outbreak of *E.coli* O104:H4 in Europe.

This issue's *Disease in Focus* section reviews tuberculosis (TB) which, although generally rare in New Brunswick, may occur more frequently among individuals born in countries with high TB prevalence. We provide information on epidemiology, clinical presentations of TB, screening and laboratory diagnosis and treatment of latent TB and TB disease. The role of public health in investigating TB cases also discussed. Further, this issue includes an update on Lyme disease including tick bite prevention measures.

We welcome feedback and suggestions for topics. Please forward them to alex.doroshenko@gnb.ca

Injury prevention for children and youth: preparing for a change of season

A change of season brings a change in the nature of activities where children and young people live, learn and play. An increase in outdoor and physical activities is positive from an obesity prevention and healthy lifestyle perspective. However, information is concerning about the vulnerability of children and youth to unintentional injuries. These can be serious and result in death or pose lifelong health implications. Contrary to popular belief, most can be prevented. This public health issue remains largely hidden.

To determine the economic and social burden of unintentional injury the Atlantic Collaborative on Injury Prevention and Safe Kids Canada prepared a report entitled *Child & Youth Unintentional Injury in Atlantic Canada: 10 Years in Review* [1]. Data were compiled from the Canadian Institute of Health Information (1996-2005) and Statistics Canada (1995-2004), and covered injuries among children aged 1 to 14. The report states that an average of 34 children die in Atlantic Canada each year due to unintentional injuries, representing the leading cause of death in this age group (37 per cent of all deaths). Another 3,100 are hospitalized each year. Children's risk of injury changes across the seasons: the number of hospitalizations increases during the warm weather (June through September), possibly due to additional outdoor activity and leisure time. Falls are the leading cause of injury hospitalization (44 per cent of admissions), including mostly falls from beds, chairs and stairs but also playground falls; falls involving ice and snow; falls associated with use of skates, skis, snowboards and rollerblades; and falls from a tree or cliff. Cycling-related hospitalizations represent eight per cent of the burden, followed by pedestrian traffic incidents at two per cent and drowning at one per cent. On average each year, more than 150 hospitalizations involve serious injuries such as traumatic brain injuries and complex fractures.

The economic burden in Atlantic Canada for unintentional injuries

among children is estimated at more than $190 million. Atlantic Canada's hospitalization rate due to this cause is reported to be higher than the Canadian average. The overall death rates are similar, although the rate for motor vehicle related deaths is lower in Atlantic Canada compared to the national average (but still the leading cause of death for 15- to 19-year-olds).

On the one hand, New Brunswick has the highest rate of hospitalizations within Atlantic Canada due to unintentional injury to children. Specifically, the province has:

- the highest rates of hospitalization in the region for poisonings, falls, playground falls, injuries from all-terrain vehicles (including off road vehicles and snowmobiles), drowning and motor vehicle occupant injury, with the peak in child passenger injuries occurring in July and August; and,
- the second highest rates for injuries related to bicycles and to fire / burns.

On the other hand, New Brunswick has the lowest rate of hospitalization for children being injured as pedestrians.

A change of season means that children and youth will be again at risk for many of these injury categories, most of which can be prevented or reduced in severity. Creating a culture of safety includes: increased awareness and education; identification of and modifications to environmental risk factors; recommending healthy public policies where gaps are identified; adding injury prevention to child and youth programs; building partnerships and networks in communities; and enhancing surveillance for child and youth injury to better define policy and program needs.

Rural and urban areas have different challenges. Economic conditions also play a role in health and injury. Not all families can afford the equipment necessary to keep their children safe. Social and material disparities leave some children and youth more vulnerable than others. More boys (60 per cent) are hospitalized for injury than girls (40 per cent). Leading causes of hospitalization are influenced by age; they are:

- younger than the age of one: falls (42 per cent);
- ages one to four: falls (35 per cent) and poisoning (20 per cent);
- ages five to nine: falls (39 per cent), playground falls (12 per cent) and cycling (11 per cent); and
- ages 10 to 14: falls (36 per cent) and cycling (11 per cent).

Health professionals can play a leadership role to reduce unintentional injuries to children and youth. In your interactions with parents and guardians reminders to be prepared for hidden dangers associated with new skills as children age could include brief discussions all year long regarding:

- the need for four-sided fencing for swimming pools; never leaving children unattended near bodies of water; the use of flotation devices; and teaching children how to swim must be combined with effective protection strategies (while most drowning incidents (74 per cent) occur in the summer, 14 per cent happen in the spring, eight per cent in the fall and six per cent in the winter*)[1];
- regularly testing smoke alarms;
- keeping medications and chemicals out of the reach of young children;
- preventing children's access to hot liquids, including hot tap water;
- using guards on windows and gates on stairs and decks;
- properly using car seats, helmets and other protective equipment;
- recommending that parents do not allow children younger than 16 to operate off-road vehicles and snowmobiles [2,3];
- providing adequate supervision while at the playground; avoiding cords and scarves that can become entangled on playground equipment.

Role modeling prevention and helping to raise funds to buy equipment are other ways to protect children in your area. Practitioners and policy makers can support improvements to policies that would reduce social and economic disparities among children.

The Office of the Chief Medical Officer of Health is developing strategies for enhanced surveillance and prevention of unintentional injuries in New Brunswick, with a focus on understanding and addressing the leading causes of injury and the impacts on the most vulnerable groups. The results and actions of related efforts will be featured in a future issue of *Disease Watch*.

Collectively we can make a difference.

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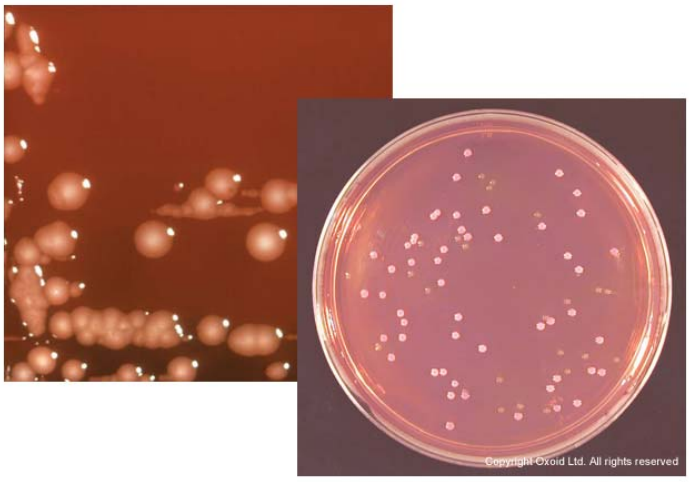
Additional resources

- A range of injury prevention resources can found on the website of the Atlantic Collaborative on Injury Prevention at www.acip.ca
- Safety tools on "ages and stages" with materials useful for parents are available through www.childsafetylink.ca

* Percentages may not sum to 100 per cent due to rounding

Outbreaks of pathogenic E. coli O157:H7 and other serotypes

Pathogenic E.coli infection has significant clinical and public health implications. Early detection remains important to protecting the health of individual patients



and the wider public. Pathogenic E.coli infection is a notifiable disease in New Brunswick. Regional Public Health offices investigate sporadic cases of pathogenic E.coli as well as clusters within their respective geographic boundaries. The Communicable Disease Control Branch of the New Brunswick Office of the Chief Medical Officer of Health (OCMOH) monitors disease activity in the province, interacts with the Public Health Agency of Canada (PHAC) on surveillance matters and participates in investigations of multi-jurisdictional outbreak of pathogenic E. coli. For outbreaks crossing provincial boundaries, PHAC coordinates surveillance and provincial responses through the Foodborne Illness Outbreak Response Protocol (FIORP) as well as communicates with international public health agencies. Outbreaks of pathogenic E.coli are frequently food-borne. Identification of the source is important to prevent further cases.

In 2011, there were several outbreaks caused by pathogenic E.coli. From February to April 2011, pulse-field gel electrophoresis (PFGE) performed on E. coli specimens collected in different provinces enabled identification of a cluster of cases of E. coli and prompted activation of the Outbreak Investigation Coordination Committee (OICC) under FIORP (http://www.phac-aspc.gc.ca/zoono/fiorp-pritioa/index-eng.php). Fourteen cases were confirmed; two of them among New Brunswick residents. The other cases were in residents of Quebec (N=10) and Ontario (N=2). The suspected source was walnuts from California distributed by Amira (a company based in Quebec). Affected products were recalled by the Canadian Food Inspection Agency in April 2011. The strain of E. coli implicated in this multi-jurisdictional outbreak was O157:H7, a serotype producing Shiga toxin (or verocytotoxin). This particular serotype (O157:H7) is the most frequent in North America; however other Shiga toxin-producing E. coli (STEC) serotypes have been identified on the continent. Serotypes O26, O111, O103, O45 and O121 are the most common after O157, in North America.

How can infection from pathogenic strains of E. coli be prevented?

- **Practise good personal hygiene.** Wash hands thoroughly with soap and water after using the washroom, handling raw meat, poultry or seafood, and after handling animals. Wash hands before handling, preparing or eating food.
- **Practise basic food safety precautions.** Do not eat raw or undercooked oysters or other shellfish. Wash fruits and vegetables thoroughly before eating. Ensure meats, poultry and fish are cooked thoroughly. Use detergent and water to clean food preparation areas and items. Use a sanitizer (i.e., chlorine-based or other approved types) to prevent the transfer of bacteria from contaminated foods to non-contaminated foods.
- **Avoid water that might be contaminated.** Do not drink untreated surface water; drink from a known potable (safe) water source. If you are using a private well, it is important to test your drinking water regularly (once or twice per year) to ensure it is safe. If your water source is questionable, bring drinking water to a rolling boil for one minute. Avoid swallowing water when swimming or bathing.
- **Practise good environmental management.** Flush or discard any vomit and/or stool in the toilet and clean the surrounding area. Use hot water

Beginning in May 2011, a large outbreak of pathogenic E.coli was detected in Germany and subsequently spread to other European Union (EU) countries. Laboratory results indicated that STEC serotype O104:H4 was the causative agent. As of the end of July 2011, the cumulative number of confirmed and probable STEC E.coli cases in the EU was 3910. This included 782 (20 per cent) HUS (hemolytic uremic syndrome) STEC cases and 3128 (80 per cent) non-HUS STEC cases. In total, in the EU, 46 persons died of confirmed or probable STEC infection due to this outbreak. Of these, 29 were HUS STEC cases and 17 were non-HUS STEC cases. Results from studies in France and Germany supported the hypothesis that seeds used for sprouts destined for human consumption (distributed to local producers or retail outlets) were contaminated with E. coli O104:H4. There has been only one case of STEC O104:H4 reported in Canada and none in New Brunswick. The outbreak in Europe was declared over in July.

Symptoms generally appear three to four days after infection; however, the incubation period can be as

short as two days or reach up to 10 days. The clinical hallmark of pathogenic E.coli infection is bloody diarrhea; however, diarrhea can also be mild and non-bloody. About 90 per cent of E.coli O157 patients experience bloody diarrhea at some point during their illness. Studies found that between 10 and 39 percent of patients with visible bloody diarrhea are diagnosed with E.coli O157:H7 infection. Other diagnostic clues include severe abdominal pain and tenderness as well as an elevated blood leukocyte count. Infection with E.coli O157 can often present without fever. People usually recover within seven to 10 days however complications such as hemolytic uremic syndrome (HUS) and thrombocytic thrombocytopenic purpura can occur in up to nine per cent of E.coli O157:H7 infections with about two-thirds of these complications seen among children younger than 10 years of age. A significant proportion of patients with HUS will require renal dialysis. Infections caused by other serotypes of pathogenic E.coli have similar clinical presentation; however, frequency of complications, virulence and epidemiology of affected groups can vary. For example, the O104:H4 outbreak in Germany affected mostly adults with a predominance of women; HUS was a common complication. Treatment of this infection is usually supportive and may require hospitalization. Antibiotic therapy is generally not recommended in patients with E.coli O157:H7 infections because of no proven benefit and possible increased risk of complications.

Stool samples should be sent for bacterial culture and further testing in all patients with bloody diarrhea. It is important to communicate with laboratories about clinical suspicion of pathogenic E.coli as well as provide relevant clinical and epidemiological information on the laboratory requisition form. Current laboratory testing will routinely detect E.coli O157:H7 serotype through culture methods, however if non-O157 is a suspected pathogen, additional tests, such as detection of Shiga toxin by EIA (enzyme immunoassay) or genes encoding toxins by PCR (polymerase chain reaction) may be necessary. The latter tests are usually performed at the National Microbiology Laboratory in Winnipeg.

E. coli can be spread through ingestion of contaminated food and water or by person-to-person or animal-to-person contact. Most cases are associated with improperly handling of raw meat or eating undercooked meat. Usually, meat becomes contaminated during the slaughtering and butchering of cattle. When the meat is ground, the E. coli on the surface is mixed throughout the meat. This is why ground meat is more likely to cause illness than whole cuts of meat such as steaks or roasts. In ground meat, E. coli can survive unless the interior is properly cooked. Infection often happens when people eat undercooked hamburgers. However, based on information collected by the United States Centers for Disease Control on the 155 E. coli outbreak that occurred between 1998 and 2008, beef was involved in only half of the outbreaks (52.9 per cent), with the other sources being produce (18.1 per cent), complex food (14.8 per cent), dairy products (6.5 per cent), beverages (1.9 per cent), bread and baked goods (0.6 per cent) and poultry (0.6 per cent).

In New Brunswick, 13 E. coli O157:H7 infections were reported in 2010, lower than the average number of 20 cases observed annually between 2005 and 2009 but consistent with numbers reported in 2008 (n=16) and 2009 (n=14). Cases are seen across all age groups although some clustering at the extremes of ages is seen. During the last five years 20 per cent of cases were among individuals over 70 years and a further 21 per cent in those younger than 10 .

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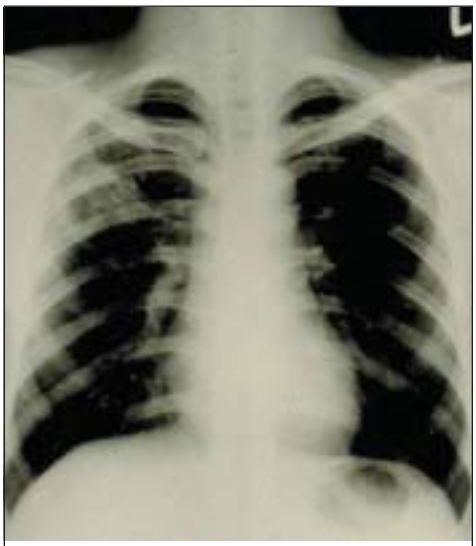
Disease in Focus

A case of tuberculosis in New Brunswick



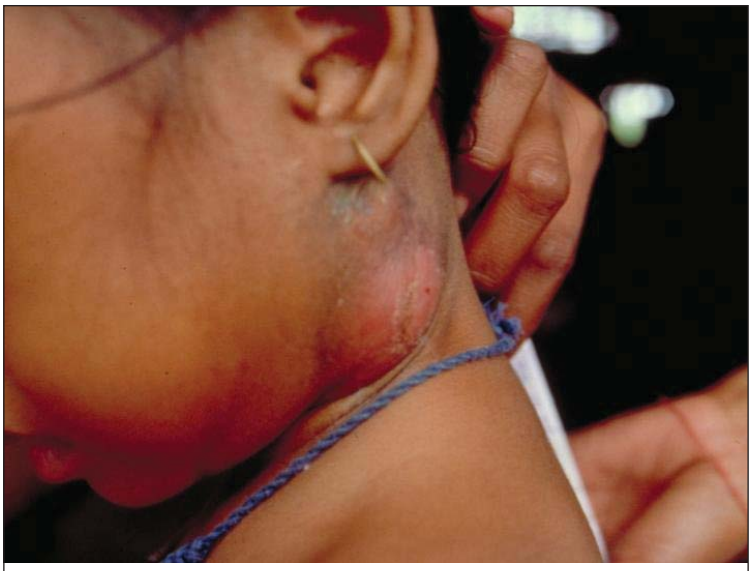
Pulmonary TB
Source: ©J. Carey Jackson; David Roesel, MD from Ethnomed: http://ethnomed.org

Earlier in 2011, a notification was received in New Brunswick of an active case of pulmonary tuberculosis (TB). The case was a foreign-born adult who had immigrated to Canada from a high TB prevalence country within the previous year. An extensive contact tracing investigation of more than 100 contacts, mostly foreign-born, revealed one close contact with active disease of

low infectivity. These findings indicated a low level of TB transmission by the index case. The two active TB cases underwent anti-TB therapy and are now considered non-infectious.

A challenge of TB investigations among a largely foreign-born population group in a low TB prevalence country is the high underlying rate of Tuberculin Skin Test (TST) positivity. In these investigations, differentiating newly infected cases from existing latent TB infection (LTBI) is challenging, particularly when history of TB exposure or previous TST status is unknown. Language barriers and social stigma surrounding TB are also important factors in contact tracing investigations among this population group.

In Canada, TB is known as a disease of historical significance having caused widespread morbidity and mortality in the early 20th century. Following major disease prevention and control efforts, overall incidence rates of TB declined and remain low in Canada today with the exception of some Aboriginal and foreign-born population groups. In 2007, the overall TB rate in Canada was 4.7 per 100,000, while the rates in foreign-born, Canadian-born Aboriginal and Canadian-born non-Aboriginal groups in Canada were 14.4, 25.8 and 1.9 per 100,000, respectively. While TB rate in foreign-born population is decreasing, the proportion of TB disease among foreign-born individuals (out of total TB cases in Canada) has been increasing in recent years. This may be a reflection of higher growth rates among foreign-born population groups relative to the general population growth in Canada. The Canadian Tuberculosis Prevention and Control Strategy aims to reduce the national incidence rate of TB disease in Canada to 3.6 per 100,000 by 2015 (specifically among the Canadian born non-Aboriginal populations to 0.6 per 100,000 or fewer; among foreign-born Canadians to 10 per 100,000 or fewer; and among First Nations, Inuit and Métis to 13 per 100,000 or fewer).



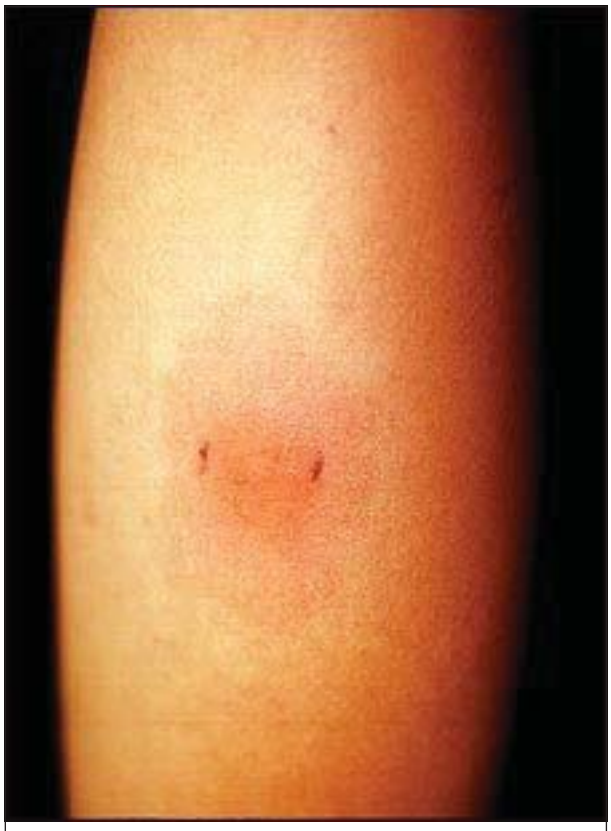
Extrapulmonary TB
Source: ©J. Carey Jackson; David Roesel, MD from Ethnomed: http://ethnomed.org

New Brunswick's incidence rate is among the lowest of the provinces and territories, with an average of six active TB cases reported per year since 2005. New Brunswick's relatively low incidence rate is largely a reflection of the province's low number of immigrant populations originating from TB-endemic countries. In fact, most TB cases reported provincially in the last 10 years were observed among Canadian-born, non-Aboriginal persons, demonstrating the low proportion of high TB prevalence groups that are more prominent elsewhere in Canada. However, as demonstrated by the recent investigation, active TB does still occur among foreign-born residents in New Brunswick, and TB diagnosis should be considered by clinicians working with immigrant population groups.

TB is an infectious disease caused by the bacterium *Mycobacterium tuberculosis*, transmitted in airborne droplets expelled from the lungs of people with active disease primarily through coughing, talking, laughing, sneezing and singing. Inhalation of these droplets can lead to infection, particularly if exposed to high concentrations of bacteria in closed, poorly ventilated or overcrowded environments over a sustained period. Transmission is also impacted by individual susceptibility and underlying health status. Humans are the primary reservoir for *M. tuberculosis*, and transmission occurs almost exclusively from person to person.

Exposure to *Mycobacterium tuberculosis* can lead to either latent TB infection or active TB disease. About five per cent of people who have been newly infected with TB bacterium will develop active disease within two years of infection, and another five per cent of infected individuals will have a life-time risk of TB re-activation. For most individuals with LTBI, the infection typically remains dormant for an extended period and will not progress to active disease. The risk for development of active TB disease among persons infected with *Mycobacterium tuberculosis* is substantially increased among individuals with HIV and AIDS, post-transplant patients, patients with chronic renal failure, silicosis, carcinoma of head and neck as well as among those with evidence of fibronodular disease on chest X-ray. Children younger than four years of age, individuals who are smokers or underweight, patients with diabetes mellitus and those treated with immunosuppressive doses of steroids or tumour necrosis factor (TNF)-alpha inhibitors are also at increased risk of progressing to active TB disease. Past exposure to *Mycobacterium tuberculosis* and LTBI can be diagnosed by performing a TST. Administering a TST involves an intradermal injection of five tuberculin units of PPD (purified protein derivative) into an inner aspect of a forearm. The TST should be read by a trained health-care professional 48 to 72 hours after its administration. Interpretation of a TST should be based on three dimensions: size of induration; positive

predictive value of the TST in an individual tested; and the risk of developing active TB disease. Both false-positive and false-negative results of a TST can occur related to either administration technique or biological characteristics. Severe active TB disease, HIV/AIDS or other immunocompromizing conditions, malnutrition, major viral illnesses and age younger than six months are associated with false-negative TSTs. Administration of Bacille Calmette-Guérin (BCG) vaccine (particularly if given after 12 months of age and more than once) as well as exposure to non-tuberculous mycobacteria (NTM) can result in cross-reactivity and false-positive TST results. Newer tests based on measurements of interferon-γ (INF-γ) produced by in-vitro stimulated T-cells (Interferon-Gamma Release Assays or IGRA) are available in New Brunswick at the laboratory in Saint John. Antigens used in IGRA are not found in BCG strains (*Mycobacterium bovis* strain used to manufacture BCG vaccine) or in NTM species. TST and IGRA tests can yield concordant and discordant results in the same individuals; therefore, indications and interpretation of IGRAs should be discussed with TB specialists in New Brunswick. Treatment of LTBI is recommended in persons with an increased risk of TB disease. The optimal regime is a nine-month daily monotherapy treatment with Isoniazid (INH); other regimes are available with shorter duration and less frequent administrations as well as Rifampin-based therapies.



Screening
Source: ©J. Carey Jackson; David Roesel, MD from Ethnomed: http://ethnomed.org

Active TB disease is most commonly present as respiratory TB, comprised of primary TB, pulmonary TB (TB pneumonia, isolated tracheal or bronchial TB, laryngeal TB, tuberculous fibrosis, atelectasis or pneumothorax), tuberculous pleurisy and TB of intrathoracic lymph nodes, mediastinum, nasopharynx, nose (septum) and sinus (any nasal). In Canada, 30 per cent of all TB cases are non-respiratory TB including peripheral TB lymphadenitis (16 per cent of cases and common in children), miliary/disseminated TB, Central Nervous System (CNS) tuberculosis, genitourinary TB, abdominal TB, tuberculosis of bones and joints, tuberculous pericarditis, ocular and cutaneous TB. Disseminated and CNS tuberculosis (e.g., TB meningitis) are life-threatening forms of TB. Pulmonary TB is the most common and presents with a persistent and productive cough, fever and night sweats, fatigue, weight loss, chest pain and/or hemoptysis. However, the most common physical finding in early pulmonary TB is a normal exam; hence, the importance to obtain an epidemiological history of potential exposure and assess for the risk of developing active TB disease. Only individuals with active pulmonary TB disease are considered infectious, and the degree of infectiousness relates to bacterial load, smear positivity of sputum and presence of cavities on chest radiography. Children with TB disease are very rarely infectious, and the diagnosis of active TB disease in a child should prompt an enquiry to find a potential source case, commonly an adult caring for the child. Diagnosis of active TB disease is based on assessment of symptoms, exposure information, physical examination, chest radiography and laboratory tests. TST and/or IGRA are not diagnostic of active TB disease. Their administration can help in assessing whether an individual has a TB infection; however, the possibility of false-positive and false-negative results should be considered. Laboratory tests to assist in diagnosis of TB disease include smears staining and microscopy to detect acid-fast bacilli (AFB), mycobacterial culture, mycobacterial TB DNA probes (not requiring amplification), nucleic acid amplification techniques (NAAT). Culture for *M. tuberculosis* is considered the gold standard in diagnosis; however, it may be challenging to obtain appropriate specimens, particularly in children. Sputum, induced sputum, broncoscopy specimens and gastric aspirate are usually collected for respiratory TB. Microbiological and histopathological specimens of relevant tissues/fluids/biopsies are collected when non-respiratory TB is suspected. Sensitivity and specificity of newer DNA probes and NAATs vary depending of the specimen and technique; therefore, the mycobacterial laboratory in Saint John should always be consulted on appropriate testing for TB. This laboratory will also be able to advise on TB drug sensitivity testing if a positive TB culture is available. Patients should be referred to TB specialists for treatment of TB disease in New Brunswick. The most common modality involves a two-month initial phase, using daily administration of three to four first-line anti-TB drug therapy (Isoniazid (INH), Rifampin (RMP), Pyrazinamide (PZA) and Ethambutol (EMB), followed by the continuation phase, using INH and RMP daily or twice weekly for an additional four months. Longer duration of treatment is required for

management of disseminated, CNS and bone TB. Other regimes may be prescribed depending on biologic and social characteristics of patients. Where available, directly observed therapy should be used when medications are administered bi-weekly, especially if the patient's compliance with treatment is in doubt. TB drug resistance is uncommon in New Brunswick, and referral to TB specialists is necessary to manage patients with suspected or confirmed drug resistance.

Active TB disease (including both respiratory and non-respiratory forms) is reportable to the Regional Medical Officer of Health **verbally within 24 hours and in writing within seven days of suspected diagnosis**. It is not necessary, or sometimes not desirable, to wait for laboratory confirmation of a TB diagnosis before reporting to Public Health. LTBI is not a notifiable disease. On receipt of notification, regional Public Health departments will initiate Public Health management of TB cases. These actions usually include contact tracing, identifying and initiating treatment of secondary active TB cases, identifying TB infected contacts to offer treatment for LTBI and identifying the source case who infected the index case. In conducting an investigation, regional Public Health staff will contact physicians, TB specialists, laboratories and epidemiologists. Public Health management of TB in New Brunswick is carried out by the regional health authorities' Public Health departments. Investigation and public health management of TB cases in health-care settings, correctional and long-term care facilities and in Aboriginal communities requires early notification to public health services. Screening for LTBI in educational and occupational settings is guided by respective institutional policies.

Management and treatment of TB in Canada is guided by the Public Health Agency of Canada's Canadian Tuberculosis Standards, which can be accessed at www.phac-aspc.gc.ca/tbpc-latb/pubs/tbstand07-eng.php. For additional information, please contact your regional Public Health office.

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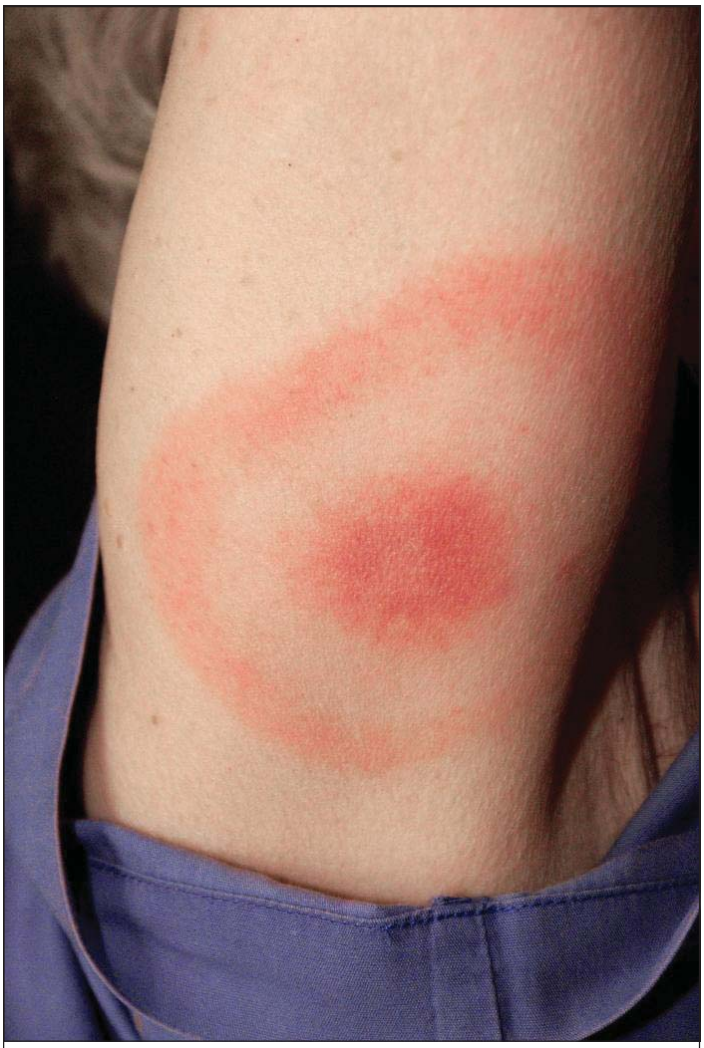
2011 update on Lyme disease

Lyme disease is caused by the spirochete Borrelia burgdorferi, which is transmitted by infected blacklegged ticks (Ixodes scapularis). Although the risk of Lyme disease is low in most areas of New Brunswick, the risk is higher in endemic areas with established tick populations. The Millidgeville area of Saint John is an endemic area. In addition, recent studies indicate that a blacklegged tick population may be established on Grand Manan, in the North Head area. There is potential that climate change may allow for blacklegged ticks to spread into additional areas in the province.



Source: Centers for Disease Control and Prevention

Blacklegged tick on foliage
Source: Public Health Agency of Canada

Clinical manifestations of Lyme disease may involve skin, joints, the central nervous system and the heart. Both early and late manifestations of the disease are observed. The most common early manifestation of Lyme disease is Erythema migrans (EM). EM is a round or oval expanding erythematous rash greater than five centimetres in diameter and enlarging slowly over several days to weeks. It appears one to two weeks (range: three to 30 days) after inoculation and persists for up to eight weeks.

Lyme disease can be diagnosed clinically if the typical EM rash is seen and there is a history of residence in or visit to an endemic area. For suspicious nontypical rashes, extracuteneous manifestations of Lyme disease and in patients presenting without history of residence or visit to an endemic area, the two-tiered laboratory testing process that follows Canadian national guidelines is recommended.

Specific information about Lyme disease, including tick bite prevention measures and reference material, is at www.gnb.ca/0053/disprev/LymeDisease-e.asp and in the *New Brunswick Disease Watch Bulletin Volume 4: 07/10*.