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New Brunswick Disease Watch Bulletin

Office of the Chief Medical Officer of Health

Introduction

Welcome to the 16th edition of the *New Brunswick Disease Watch Bulletin*.

In this issue, we have information on new food premises regulations being implemented in the province. As well, we outline the new recommendation for rabies post exposure prophylaxis of immunocompetent persons previously unimmunized with rabies vaccine. This issue also focuses on Legionnaires disease; providing information on epidemiology, trends and disease overview, clinical and laboratory diagnosis, and Public Health management information. We also include a reminder for health care providers from the NB immunization team on proper storage temperatures for vaccines.

Electronic copies of the bulletin can also be found on the Department of Health website under publications at: http://www2.gnb.ca/content/gnb/en/departments/ocmoh/publications.html.

After you're done reading, we encourage you to share your copy with your colleagues. We also welcome feedback and suggestions for topics to alex.doroshenko@gnb.ca.

Update on New Brunswick's Food Premises Regulation

The Government of Canada estimates that there are about 11 million cases of foodborne illness in Canada every year. Many foodborne illnesses can be prevented by following safe food handling and preparation techniques [1].

The Department of Health, through its food premises inspection program, works to eliminate, reduce and control foodborne illness, as well reduce the number of foodborne disease outbreaks, through education, regulation, and investigation of incidents in facilities regulated under provincial legislation [2]. Public health inspectors and agri-food inspectors within the Health Protection Branch conduct routine food safety inspections of licensed premises as well as investigate health hazard complaints with respect to food safety that fall within provincial authority. Public health inspectors also investigate enteric communicable disease cases and partake in outbreak investigations, part of which often involves investigating the food safety operations of food premises where linkages are suspected or confirmed. It is important to emphasize the value of vomit and/or stool sampling (whichever is more appropriate) and analysis from patients presenting with signs of enteric illness. This information is invaluable for further investigation and identification of potential sources of enteric illness. Gathering of information through case interviews provides insight into whether there is an outbreak and whether there may be a common linkage among cases that requires further investigation. For example, a common linkage could be a food premises, contaminated food source, or a contaminated water supply. Pinpointing the source enables Public Health to ensure appropriate control measures are put in place to prevent further cases of illness.

A summary of the regulatory framework is provided below.

Legislation

The *Public Health Act* regulations came into effect November 20, 2009. The *Food Premises Regulation 2009-138* under the Act provides requirements for premises where food is processed, prepared, stored, handled, displayed, transported, sold and/or offered for sale.

This legislation is in line with that of many of provincial counterparts across Canada. The new legislation is primarily outcome-focused, allowing regulators much more flexibility in terms of compliance evaluation during inspection and food premises approvals. Each premise is assessed on an individual and case-by-case basis without a 'one size fits all' approach. The legislation emphasizes an overall outcome of food safety.

Who does the new legislation apply to?

Regulation 09-138 defines 3 classes of food premises license. The classes are based on the types of food activities being carried out. Licensing requirements vary slightly among the classes with more stringent requirements being applied to higher risk activities.

Food premises require a licence if they are undertaking any of the following activities:

- Class 3: Storing, handling, displaying, distributing and selling "potentially hazardous food" with no actual food preparation [3]. Some examples of Class 3 facilities include some convenience stores, fish peddlers, food warehouses, some temporary event food booths, some public market vendors, etc.
- Class 4: Preparing or processing food (without killing or pasteurizing) or thermal processing of meat or fish, but not wholesaling [3]. Some examples include restaurants, take-outs, catering kitchens, meat cut-up shops, fish markets, some public market vendors, soup kitchens, some temporary event food booths, etc.
- Class 5: Processing food for direct sale or wholesale and preparing food for wholesale [3]. This includes abattoirs, some bakeries and restaurants, canneries, dairy plants, fish salting, beverage bottling and maple syrup operations.

Implementation

A phase-in approach is used for implementation of new regulations. Implementation began with those food premises which were already licensed and routinely inspected under previous legislation. This mainly included eating establishments such as restaurants, take-outs and mobile canteens, bakeries, grocery store departments, fish buyers and peddlers, abattoirs and dairy plants.

In addition to the above, some previously licensed premises were subject to significant changes. Special attention was given to these items during implementation to ensure facilities were meeting these new requirements. These notable changes are as follows:

- *Recall criteria:* Class 5 licensees are now required to maintain and keep various preparation, processing and process control records for a certain period of time, as well as comply with notification requirements [3].
- *Food safety training and certification requirements*: Class 4 premises are now required to have at least one person present at all times in the area of a food premises where food is being prepared **and** the manager of the food premises hold a certificate from an appropriate food handling program [3].

Day cares and adult and child residential facilities: These facilities were previously subject to a general health inspections which included food safety

Potentially hazardous "means a form or state that is capable of supporting the growth of pathogenic microorganisms or the production of toxins" [3].

Examples of potentially hazardous foods:

- Meat and meat products
- Fish, shellfish and seafood products
- Poultry
- Eggs
- Cream-filled pastries and pies
- Cut fruits and vegetables

aspects. While still subject to this inspection, they now also require food premises licensing (Class 3 or 4) involving a separate inspection of the food area(s).

Meat cut-up shops: These premises now require a Class 4 license and are subject to routine inspection. Classes 3 and 4 at public markets: Health Protection Branch regions are currently in the process of meeting with public market operators and necessary food vendors to educate them on the new requirements. 'New Brunswick Public Market Guidelines for Food Premises and Market Operators' have been developed and distributed [4]. Areas where licensing has yet to be implemented include Class 5 food processing, Classes 3 and 4 at temporary events, all other Class 3, and Class 5 maple syrup. Implementation dates will vary between now and 2014 and will be dependent upon public health risk, resource capacity, and other potential limiting factors.

Clinicians are reminded that while public health works to ensure safe food supply through regulations and inspections, suspected or confirmed cases of food- or waterborne infections as well as outbreaks of enteric illnesses should be reported to the Regional Medical Officers of Health.

References:

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2. New Brunswick Department of Health. *Food Premises Standard Operational Procedures*. Version 3.0 April 2012.
3. *Food Premises Regulation 2009-138* under the *New Brunswick Public Health Act*. Available at: http://laws.gnb.ca/en/BROWSECHAPTER?listregulations=P-22.4&letter=P#P-22.4.
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Reminder from the NB Immunization Team

Proper storage temperatures must be maintained at every link in the cold chain regardless of seasonal temperature fluctuations

It is very important to ensure that all vaccines and biologics are maintained under cold chain conditions at all times. Vaccines are sensitive biological products which may become less effective, or even destroyed, when exposed to temperatures outside the recommended range (2°C- 8°C). Cold-sensitive vaccines experience an immediate loss of potency following freezing. Vaccines exposed to temperatures above the recommended temperature range experience some loss of potency with each episode of exposure. Repetitive exposure to heat episodes results in a cumulative loss of potency that is not reversible [1,2,3].

Did you know that…

- "An estimated 17 per cent to 37 per cent of healthcare practitioners expose vaccines to improper storage temperatures"? [4]
- "Vaccine failures caused by administration of compromised vaccine may result in the re-emergence or occurrence of vaccine preventable disease"? [5]
- "Refrigerator temperatures are more commonly kept too cold rather than too warm"? [4, 6]
- In the colder winter months in Canada vaccines can be exposed to lower temperatures?
- **Temperatures falling outside the recommended range require immediate action to avoid loss of product.**

References:

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4. Bell KN, Hogue CJR, Manning C et al. Risk factors for improper vaccine storage and handling in private provider offices. Pediatrics 2001; 107(6):1–6.
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Legionnaires' disease

Epidemiology

In late summer 2012 Quebec City experienced an outbreak of legionellosis. By September 24, 180 *legionella* cases were confirmed and 13 deaths were associated with the outbreak [1].

The first date of onset was July 17, 2012. The suspected sources were the cooling towers of air-conditioning systems in large buildings in Quebec City's downtown. Upon inspection, a particular location of cooling tower was identified as the source of the outbreak. The towers were subsequently disinfected.

Cooling towers are devices used to cool buildings; also referred to as "wet air conditioning systems" because the process of cooling air involves extensive contact between water and air, thereby creating aerosols.

At this time, one New Brunswick resident was associated with the outbreak, but no others have been identified.

Trends

Each year in Canada, an average of 100 or more cases of *legionella* are reported (0.33 cases per 100,000 population). However, surveillance data to date suggests the number and rate of disease has been increasing since 2004: from 42 cases in 2004 (0.13 per 100,000) to approximately 250 cases in 2011[§] (0.72 cases per 100,000). While a large outbreak in Ontario accounted for the increase in 2005, the increasing trend continues to be observed. Given the passive nature of *legionellosis* surveillance, it is unclear if the sustained increase in cases is due to a real increase in infections, or due to other reasons such as changes in environmental conditions (i.e. increased heat, humidity and changes in rainfall patterns), increased vigilance or changes in clinicians' testing patterns with the availability of highly sensitive urine antigen test methods.

In New Brunswick, 22 cases were reported to Public Health between 2000 and 2011. On average, two cases are reported each year with a range from zero cases in 2002 and 2003 to five cases in 2005.

Disease overview

The bacterium responsible for Legionnaires' disease was identified in 1976, after a large outbreak at an American Legion convention in Philadelphia USA.

Legionella pneumophila is the most frequent cause of human legionellosis and a relatively common cause of community-acquired and nosocomial pneumonia in adults. *L. pneumophila* bacteria are common and can be found naturally in environmental water sources such as rivers, lakes and reservoirs, usually in low numbers. The bacteria are able to survive in nature and can multiply in man-made aquatic systems like cooling towers, evaporative condensers, humidifiers, decorative fountains and hot water systems. Other species of *Legionella, Legionella longbeachae* have been described as a source of sporadic and outbreak cases of legionellosis in Australia and Scotland with gardening and use of potting mix being risk factors [2].

Legionellosis has two distinct clinical and epidemiologic manifestations: Legionnaires' disease and Pontiac fever. Both are characterized by headache, myalgia (pain in one or more muscle groups), loss of appetite and a general sense of not feeling well. A nonproductive cough, abdominal

Table 1. Features of Legionnaires' disease and Pontiac fever [3]

	Legionnaires' disease	Pontiac fever
Clinical features	Pneumonia: cough, fever, chest pain	Influenza-like illness (fever, chills, malaise) without pneumonia
Radiographic pneumonia	Yes	No
Incubation period	2-14 days after exposure	24-48 hours after exposure
Etiologic agent	*Legionella* species	*Legionella* species
Attack rate[¤]	< 5%	> 90%
Isolation of organism	Possible	Virtually never
Outcome	Hospitalization common Case-fatality rate: 5-30%[¥]	Hospitalization uncommon Case-fatality rate: 0%

[§] National Data for 2009-2011 is preliminary and subject to change
[¤] Percent of persons who, when exposed to the source of an outbreak, become ill.
¥ Percent of persons who die from Legionnaires' disease or Pontiac fever.

pain and diarrhea are common. The spectrum of Legionnaires' disease is broad and ranges from mild cases with no or few symptoms to a rapidly progressive pneumonia and sometimes death. Symptoms start an average of five to six days (range two to 10 days) after exposure to the bacteria. Pontiac fever is not associated with pneumonia or death. Symptoms start an average of 24 to 48 hours (range five to 66 hours) after exposure to the bacteria. Patients recover spontaneously in two to five days without treatment.

Inhalation of waterborne droplets contaminated with *Legionella* is believed to be the primary mechanism of entry into a person's respiratory tract. Legionnaires' disease can be nosocomial, community-acquired or travel-related.

The organism has been isolated from hot water systems (showers), air-conditioning cooling towers, evaporative condensers, humidifiers, whirlpool spas, respiratory therapy devices, decorative fountains, hot and cold water taps, hot tubs, creeks and ponds and the soil from their banks. *Legionella* can survive in water stored between 0°C and 60°C, can withstand normal level of chlorination and are aided by stagnation and sediment in the water. However, optimal growth of legionallae occur at temperatures between 25°C and 45°C, so the highest risk of transmission occurs with water systems that leads to aerosolisation of water that was stored at these temperatures [4]. There is no person to person transmission.

A person's risk of acquiring Legionellosis after exposure to contaminated water aerosols depends on the type and intensity of exposure, and the exposed person's health status. People who have a severely impaired immune system or chronic underlying illness are at markedly increased risk for Legionellosis. Those with diabetes, chronic lung disease, renal disease or malignancy; those who smoke cigarettes, and the elderly are at moderately increased risk of infection. In addition to these risk factors hospital patients or nursing home residents often reside in old building with old water systems, increasing the risk for *Legionella*. Using respiratory therapy devices may aid nosocomial transmission [5].

Clinical and laboratory diagnosis

Most patients with Legionnaires' disease will have pneumonia since the *Legionella* bacteria grow and thrive in the lungs. Pneumonia is confirmed either by chest x-ray or clinical diagnosis. Several laboratory tests can be used to detect the *Legionella* bacteria within the body. The most commonly used laboratory test for diagnosis is the urinary antigen test, which detects *Legionella* bacteria from a urine specimen. If the patient has pneumonia and the test is positive, then the patient is considered to have Legionnaires' disease. Additionally, if the *Legionella* bacteria are cultured (from a lung biopsy specimen, respiratory secretions, or various other sites), the diagnosis of Legionnaires' disease is also considered confirmed. Finally, paired acute and convalescent sera that show a greater than 4-fold increase in IgG levels, will confirm the diagnosis.

Table 2: National Case Definitions [6]

Confirmed case
Clinical illness (Legionnaires' disease or Pontiac fever) with laboratory confirmation of infection and:
• isolation of *Legionella* species or detection of the antigen from respiratory secretions, lung tissue, pleural fluid or other normally sterile fluids
OR
• a significant (e.g. fourfold or greater) rise in *Legionella* species IgG titre between acute and convalescent sera
OR
• IgG titre > 1:128 against *Legionella* species
OR
• demonstration of *L. pneumophila* antigen in urine
Probable case
Clinical illness with demonstration of *Legionella* species DNA

Public Health management

As per the *New Brunswick Public Health Act and Regulation 2009,* clinicians should report all suspected and confirmed cases, clusters or outbreaks of legionellosis to regional public health verbally within 24 hours and in writing within seven days [7]. Cases reported to Public Health are classified as confirmed or probable according to the National Case Definitions (table 2).

For management of patients with Legionnaires' disease, please refer to the most recent guidelines from the Infectious Disease Society of America (IDSA) for community-acquired pneumonia specific to *Legionella* disease, Guidelines for *Legionella* disease can be found at http://www.thoracic.org/statements/resources/mtpi/idsaats-cap.pdf. Levofloxacin (or other fluoroquinolone) or azithromycin are the current drugs of choice for treatment of Legionnaires' disease. Patients with Pontiac fever usually recover completely within a week, no treatment is necessary.

Clinicians should have a heightened suspicion for nosocomial and community-acquired *legionella* in patients in risk groups with pneumonia with appropriate exposure history. In a suspected case Public Health will obtain risk factor history including places of work and residence, visit for occupational and leisure reasons, exposure to hotels, air conditioning, whirlpools, humidifiers, nebulizers, etc.

Engineering design, maintenance and monitoring of water system are important prevention measures. Hot water should be stored above 60 °C and cold water delivered below 20 °C. In case of nosocomial *legionella* review the patients' history in the facility and identify the places of hospitalization and exposure. Test all patients with nosocomial pneumonia who are in moderate to high risk groups. If a nursing home is affected, testing residents who have been hospitalized with pneumonia may be needed. Use sterile water for respiratory therapy devices.

Outbreaks of travel-associated legionellosis are also identified with more than 20 per cent of all cases thought to be associated with recent travel [8]. Outbreaks of Legionnaires' disease among travelers are difficult to detect because of the low attack rate, and the dispersal of persons from the source of the outbreak. Timely reporting of travel-associated cases could allow early identification and control of known sources of infection. Decontamination of implicated sources by superchlorination and/or superheating water supplies has been effective [9].

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New recommendation for rabies post exposure prophylaxis

The National Advisory Committee on Immunization and New Brunswick Public Health has recently changed recommendations for rabies post exposure prophylaxis of immunocompetent persons previously unimmunized with rabies vaccine.

Thorough cleaning and flushing the wound with soap and water is still the most important post exposure measure. Post exposure prophylaxis of immunocompetent persons previously unimmunized with rabies vaccine consists of both Rabies Immune Globulin (RabIG) and rabies vaccine – either human diploid cell rabies vaccine (HDCV) or purified chick cell embryo cell rabies vaccine (PCECV). RabIG provides immediate passive protection until the exposed person mounts an immune response to vaccine.

The new recommendation for rabies post exposure prophylaxis of immunocompetent persons previously unimmunized with rabies vaccine is a shortened schedule of a four dose vaccination regimen with one dose of rabies immune globulin (RabIG). The first vaccine dose (1.0 ml IM) is administered as soon as possible after exposure (day 0), with one dose of RabIG (20 IU/kg body weight for all age groups) also given on day 0. Additional vaccine doses (1.0 ml IM) should be administered on days 3, 7, and 14 after the first vaccination.

Rabies vaccine is administered IM into the deltoid muscle in older children and adults or into the vastus lateralis muscle (anterolateral thigh) in infants. Rabies vaccine should not be administered into gluteal muscle. At a site distant from the site of vaccine administration RabIG should be thoroughly infiltrated into the wound(s) and surrounding area; any remaining volume is administered IM using a separate needle and syringe. RabIG can be diluted twofold to threefold in a solution of 0.9 per cent sodium chloride to provide enough volume for multiple wound infiltration. If the site of the wound is unknown, the entire dose of RabIG is administered IM at a site distant from the site of vaccine administration.

Source: Centers for Disease Control and Prevention

Post exposure prophylaxis of immunocompromised persons previously unimmunized with rabies vaccine remains unchanged and is a five dose vaccination regimen with one dose of RabIG. Immunocompromised persons include those high dose taking corticosteroids [daily dose of ≥20 mg or ≥2 mg/kg in children of prednisone equivalent for ≥ 14 days] or other suppressive agents, those who have immunosuppressive illnesses (e.g. congenital immunodeficiency, human immunodeficiency virus infection, leukemia, lymphoma, generalized malignancy) or those taking chloroquine or other antimalarials. The first vaccine dose (1.0 ml IM) is administered as soon as possible after exposure (day 0) with one dose of RabIG (20 IU/kg body weight for all age groups) given on day 0. Additional vaccine doses should be administered on days 3, 7, 14, and 28 after the first vaccination.

Recommendations for post exposure prophylaxis of previously immunized individuals remain unchanged. A two dose vaccination regimen is recommended and RabIG is not indicated. The first vaccine does (1.0 ml IM) is administered as soon as possible after exposure (day 0) and the second dose should be administered on day 3 after the first vaccination. Appropriate rabies immunization consists of either documentation of a complete course of pre-exposure or post-exposure prophylaxis with HDCV or PCECV, OR documentation of complete immunization with other types of rabies vaccine or with HDCV or PCECV according to unapproved schedules with the demonstration of an acceptable concentration of neutralizing rabies antibody in serum [1].

A complete course of HDCV or PCECV plus RabIG is recommended for those who may have received rabies vaccines in the past but do not fulfill the above criteria for appropriate vaccination. A serum sample may be collected before the initiation of post-exposure prophylaxis, and if an acceptable antibody concentration (0.5 IU/mL or greater) is demonstrated, the vaccine course may be discontinued, provided at least two doses of vaccine have been given. If in doubt, consultation with an infectious diseases specialists or Medical Officer of Health is recommended.

Recommendations for pre exposure prophylaxis remain unchanged. For more information see *Canadian Immunization Guide*, Evergreen Edition 2012 at http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-rabi-rage-eng.php.

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