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New Brunswick Disease Watch Bulletin

Farewell to Dr. C. Scott Giffin

It is with a heavy heart that the Office of the Chief Medical Officer of Health says farewell to Dr. C. Scott Giffin, regional medical officer of health (RMOH) for South (Saint John) Region, who retired on Dec. 18, 2015. He worked as an RMOH for more than 12 years (in addition to four years in the 1990s).

Dr. Giffin was well liked and respected by his colleagues within Public Health and in the community. Regional Public Health staff always felt well supported by him – he maintained an “open door” policy and worked closely with staff to determine key questions and approaches to public health concerns. He was known for his common sense approach and did not shy away from “rolling up his sleeves” to get the job done.

Dr. Cristin Muecke, medical officer of health (MOH) for provincial programs, recalls: “Scott’s competence and commitment to Public Health were evident from the moment we first met, when I joined the New Brunswick team in 2005. He has been an excellent mentor and colleague.”

He was passionate about a wide variety of public health issues, including environmental

Office of the Chief Medical Officer of Health

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We welcome feedback and suggestions for topics. Please submit them to our editor Dr. Cristin Muecke, Medical Officer of Health - Provincial Programs at dr.cristin.muecke@gnb.ca.

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>.



In this photograph from 2008, Dr. C. Scott Giffin participates in the active surveillance of ticks. Colleagues remember him for his dedication, common sense and willingness to do whatever was needed to get the job done. Dr. Giffin retired Dec. 18, 2015.

topics such as air/water quality and industrial impacts; poverty initiatives with a focus on child poverty; harm reduction strategies; and zoonotic infections such as rabies and Lyme disease.

He maintained active and collegial relationships with a variety of stakeholders, including taking the time to orient new physicians to his region and to the Public Health services available. Debra Godlewski, director (Public Health), Saint John Area, Horizon Health Network, says: “Dr. Giffin lives an acknowledgement of the diversity of factors that affect the health of our population...[and]

has been a well-respected, articulate voice of Public Health in southwestern New Brunswick.”

Janet Wilson, manager (Public Health), Saint John Area, Horizon Health Network, adds: “I believe that his legacy with us in Public Health is that he fostered our love of what we do. He reminded us through

stories, pep talks and his knowledge. He inspired us all to be and do better because he lived out his belief that what we do in Public Health matters so very much.”

We wish Dr. Giffin all the best in his retirement and future endeavours!

New Medical Officer of Health in South Region

The Office of the Chief Medical Officer of Health is pleased to welcome a new medical officer of health (MOH) to our team – Dr. Isaac Sobol.

Dr. Sobol arrived in November 2015, and he has been transitioning into the role of regional medical officer of health (RMOH) for South (Saint John) Region following the retirement of Dr. C. Scott Giffin.



Dr. Sobol obtained his MD degree at Queen’s University in Kingston, Ont., in 1985. He completed a three-year family practice residency at Queen’s and received his CCFP in 1989. He went on to obtain a Master’s degree in health sciences and completed a community medicine residency at the University of British Columbia (UBC) in 1999.

Since then, most of his work has been in the area of Aboriginal health, working in a Métis community in Saskatchewan; living and working in the Nisga’a Nation reserve of New Aiyansh in northern British Columbia; working as an MOH in northwestern British Columbia; serving as chief MOH in Nunavut; and, most recently, working for the First Nations and Inuit Health Branch, Health Canada, and, after the transition, for the First Nations Health Authority.

Dr. Sobol has also been a member of the faculty at UBC, working as director of the division of Aboriginal Peoples’ Health in the Department of Medicine.

Dr. Sobol has served three terms on the board of the Canadian Public Health Association. He has been a member of the advisory board of the Institute of Aboriginal Peoples’ Health – Canadian Institutes of Health Research. He has been a member of the advisory board of the National Collaborating Centre for Aboriginal Health since its inception.

In addition to his employment, Dr. Sobol led health-care teams to the community of Yushu, in Qinghai province, China, each year for 10 years. The team provided acute-care services at no charge for the poor, including diagnosis, and treatment for acute and chronic disease; and assessment and provision of equipment by occupational therapists and physiotherapists.

Medical indications to supplement healthy term breastfed infants

Breastfeeding initiation rates in New Brunswick have increased considerably in recent decades, from 51 per cent in 1992 to 80 per cent in 2014. [1] Yet, of the babies who initiated breastfeeding in 2014, only 58 per cent were still exclusively breastfed at their discharge from hospital. [2] Health Canada also reported that close to 25 per cent of mothers who initiate breastfeeding stop before their infant is one month old. [3]

The most recent scientific evidence indicates that exclusive breastfeeding (only breastmilk, no food or fluid except vitamins and medications) for the first six months is associated with the greatest protection against major health problems for mothers and infants.

There are many barriers to sustaining breastfeeding, including cultural practices, lack of family and social support, lactation problems and hospital/clinical practices. Clinical practices directly affect a mothers’ ability to initiate and sustain exclusive breastfeeding – examples of positive practices include placing a healthy newborn in skin-to-skin contact with the

mother rather than on an infant warmer, keeping the baby in the room with the mother at the hospital, and not giving supplements to breastfed infants without medical indications. [4] These are all identified as best practices by the World Health Organization Baby-Friendly Initiative. [5]

Risks of supplementation

Supplementation of newborns in hospital with any food or drink (infant formula, glucose water, etc.) other than breast milk is rarely needed and should only be given when medically indicated and with the parent's informed consent. Unfortunately, formula supplementation of healthy newborn infants in New Brunswick hospitals, without medical indication, is common. Well-meaning health-care providers may offer supplementation as a means of protecting mothers from becoming overtired or stressed, although this at times conflicts with their role of promoting and protecting breastfeeding. Unnecessary supplementation is associated with shortened duration of breastfeeding. It may undermine a mother's confidence about her ability to meet her infant's nutritional needs and give inappropriate messages that may result in a continued supplementation of the breastfed infant at home.

There are additional risks associated with supplementation: [6]

- increased risk of diarrhea and other infections;
- potential disruption of the "supply and demand" cycle, leading to inadequate milk supply;
- potential alteration of infant bowel flora;
- risk of delayed lactogenesis;
- potential sensitization of the infant to foreign proteins; and
- maternal engorgement due to decreased frequency of breastfeeding.

Medical indications for supplementation (adapted from WHO)⁷

Whenever interruption or cessation of breastfeeding is considered for a medical reason, always consider the risks posed by using a breastmilk substitute (e.g., infant formula).

Infants who should not receive human milk:

- Some inborn errors of metabolism (e.g., galactosemia, maple syrup urine disease);
- Phenylketonuria: a special phenylalanine-free formula is needed. Some breastfeeding is possible, under careful monitoring.

Infant conditions that may require supplementation for a limited period, with continued breastfeeding:

- Birth weight < 1,500 g.
- Gestation < 32 weeks.
- At risk of hypoglycemia by virtue of impaired metabolic adaptation or increased glucose demand.
- Significant weight loss > 10 per cent below birth weight (mother's milk production not established).
- Not regaining birth weight by two weeks after birth.
- Exhibiting clinical indications of insufficient milk intake (meconium five or more days after birth, or no bowel movements, or fewer than one a day in the first two weeks of life).
- Inadequate weight gain of less than:
 - » 115 g/week: two weeks to four months;
 - » 85 g/week: four to five months;
 - » 60 g/week: six to 12 months.

Maternal conditions that may justify avoidance or complete cessation of breastfeeding:

- Severe illness that prevents a mother from caring for her infant (e.g., sepsis).
- Herpes simplex virus type 1 (HSV-1) (until active lesions near the nipple and areola resolve).
- Specific maternal medications (sedating psychotherapeutic, anti-epileptic and opioid drugs, radioactive iodine-131, cytotoxic, chemotherapy, excessive use of topical iodine or iodophors).
- Maternal HIV.*

Maternal conditions during which breastfeeding can still continue, although health problems may be of concern, require close monitoring and may require supplementation:

- Breast abscess (breastfeeding should continue on the unaffected breast; feeding on the affected breast can resume once treatment has started).
- Hepatitis B.
- Hepatitis C.
- Mastitis if breastfeeding is very painful, milk must be removed by expression to prevent progression of the condition.
- Substance use (mothers should be encouraged not to use these substances and given opportunities and support to abstain and apply harm reduction principles).
- Delayed lactogenesis (e.g., retained placenta, Sheehan syndrome).
- Breast surgery.

*In Canada, HIV positive mothers are advised to feed with a breastmilk substitute. In some countries, management may be different when the use of a breastmilk substitute is not acceptable, feasible, affordable, sustainable and safe. [8]

Ten steps to support parents' decision to breastfeed their baby (adapted from The American Academy of Pediatrics) [10]

Parents benefit from seeing their breastfeeding decision supported and reinforced by the environment created by your office and practice.

Health-care practitioners should:

- Encourage exclusive breastfeeding for the first six months whenever possible and discourage inappropriate supplementation.
- Educate their staff on how they can support breastfeeding families.
- Encourage parents to participate in prenatal breastfeeding education.
- Prepare families for success by promoting skin-to-skin contact, early and exclusive breastfeeding, rooming-in and cue-based, unrestricted feeding.
- Be aware of the very few medical contraindications to breastfeeding.
- Identify mothers with lactation risk factors.
- Manage common illnesses to avoid interruption of breastfeeding.
- Have a list of the community resources available:
 - » http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/HealthyPeople/BreastfeedingSupportServicesNB_e.pdf
- Avoid serving as advertisers of infant formula. For example, remove commercial logos that endorse formula from your office (notepads, pens, baby-scale paper, calendars) and avoid distributing free formula to mothers who have chosen to breastfeed.
- Post signs in the waiting area encouraging mothers to feel free to nurse wherever they are comfortable and whenever they desire. Order your sign at:
 - » <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/RegistrationForm-FormulaireInscription.pdf>



How to supplement

For most babies who require supplementation, it is a generally temporary measure, and the goal is to return to feeding at the breast. It is important to provide the mother with ongoing support and suggestions to help her maintain and preserve lactation while supplementing; and to use a supplementation method that is the least likely to compromise the transition to exclusive breastfeeding. There are many methods from which to choose: a lactation aid device at the breast, cup feeding, spoon or dropper feeding, finger-feeding or syringe feeding. All methods have potential risks and benefits. [6]

The first choice of milk for supplementation is the mother's colostrum or milk that has been expressed. Hand expressing or using a breast pump after the newborn has fed at the breast will give a high calorie milk to use for supplementation and will increase the mother's milk supply. If the volume of the mother's colostrum or milk does not meet her infant's feeding requirements, pasteurized donor human milk is the next best alternative; infant formula is the last choice. Supplementation with sugar water has been associated with rebound hypoglycemia, weight loss and increased bilirubin levels in babies and so should be avoided. [9]

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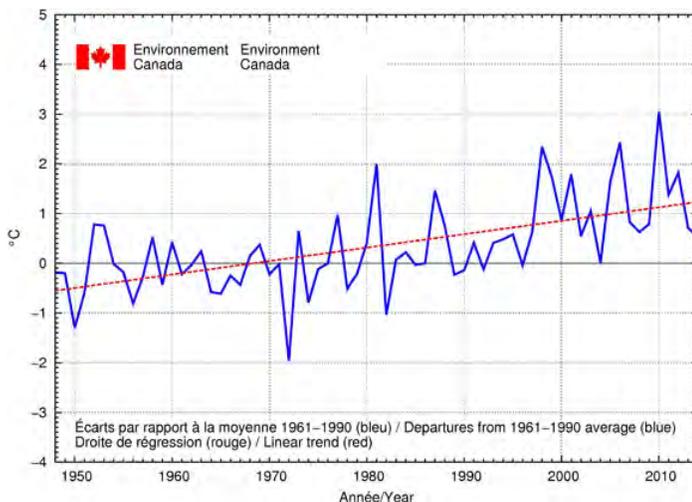
The effects of global warming on health

To truly understand the implications of the Paris Conference on Global Warming held in early December 2015, it is important to determine the cause of the warming and its effects on health.

Greenhouse gas (GHG) emissions that result from the use of fossil fuels and human activities are responsible for the global warming we are experiencing today. The most important GHG emissions are carbon dioxide (CO₂) and methane (CH₄). [1,2] Since the Industrial Revolution, these gases have been increasing in the atmosphere. [3,4]

As a result, the average temperature of the planet has already increased by close to 1°C. [4]

Figure 1: Increase in national annual temperature in Canada, 1948 to 2014



The effects of global warming are already occurring.

The use of human health determinants to analyze these effects reveals a very worrying situation. It can be seen that it has already had impacts on human health and well-being. [1]

The most evident consequence of global warming on human health is mortality related to heat waves that are more intense and frequent and which can happen here. [1,5]

However, most of the effects are indirect:

- The production of ozone and smog, which has harmful effects on the cardio-respiratory system, particularly in vulnerable individuals.
- Precipitation in New Brunswick has increased. [6] This could cause an increase in disease-

transmitting insects and zoonotic diseases.

- The incidence of Lyme disease, a zoonotic disease of concern, has been increasing in Canada and New Brunswick in recent years. [7]
- Forest fires, which are more frequent in dry areas, produce a great deal of smoke that can affect large populations at great distances.
- Rising sea levels will have an impact on storm surges that could regularly reach three to nine metres on the New Brunswick coast by the end of the century. These surges will have an impact on people's physical and psychological health and could contaminate sources of drinking water along the coastlines. [8,9]

Humanity must now make difficult decisions to prepare for the climate changes that are underway and attempt to curb them. We must significantly reduce our dependence on fossil fuels and encourage the development of new green energy sources. The agreement reached in Paris may be a pivotal point in the wake of these changes.

The clinician's role in climate change

Climate change has increasingly become a focus of major medical journals including a call for physicians and nurses to act at individual and organizational levels. Here is a sample of resources available:

- Physician's roles on the front line of climate change. Canadian Medical Association Journal 2013. Accessed November 2015 and available from: <http://www.cmaj.ca/content/185/3/195>
- Climate change: Should family physicians and family medicine organizations pay attention? Canadian Family Physician 2013. Accessed November 2015 and available from: <http://www.cfp.ca/content/59/5/462.full>
- Climate change: Challenges and opportunities for global health. JAMA 2014; 312(15):1565-1580.
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- The role of nurses in addressing climate change. Canadian Nurses Association 2008. Accessed November 2015 and available from: https://www.cna-aiic.ca/~media/cna/page-content/pdf-en/climate_change_2008_e.pdf?la=en

"Climate change is the biggest global health threat of the 21st century." [7]

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Working together to improve the immunization status of children entering school in New Brunswick

Immunization is one of the most successful and cost-effective measures for preventing disease. The New Brunswick Immunization Program strives to protect the public from illness, disability and death associated with vaccine preventable diseases. This is accomplished through the partnerships and collaborations of our immunization providers.

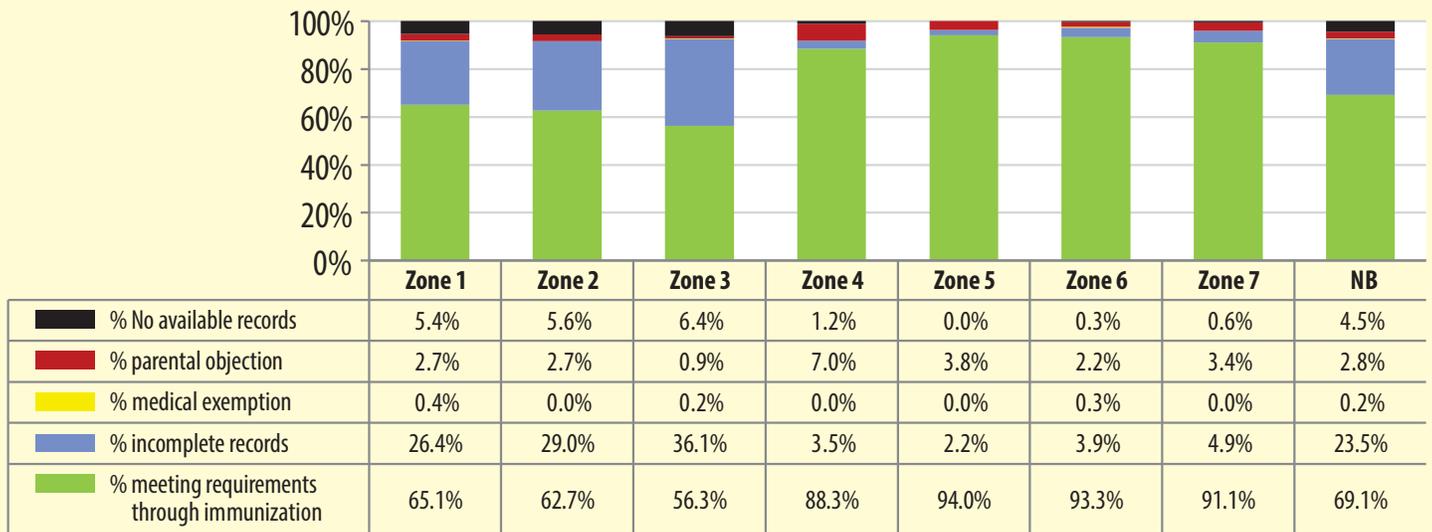
Daycare and school immunization report

The Office of the Chief Medical Officer of Health has recently released a [Daycare, School Entry and School Program Immunization Report](#) using data obtained from the 2012-13 to 2014-15 school years. [1] This report describes important immunization trends for children attending daycare, entering kindergarten for the first time and receiving vaccines through the school-based immunization programs. This information is used to better inform Public Health policies and programs.

The data for daycare and school entry represent children with proof of immunization, meaning the parent/guardian has submitted an up-to-date for age vaccination record. Incomplete or absent records are not evidence that children are unvaccinated because this may be due to non-submission by parents or a lost record. Lost records can be difficult to replace because there can be a substantial cost associated with obtaining a new one and, in some instances, the records are no longer accessible.

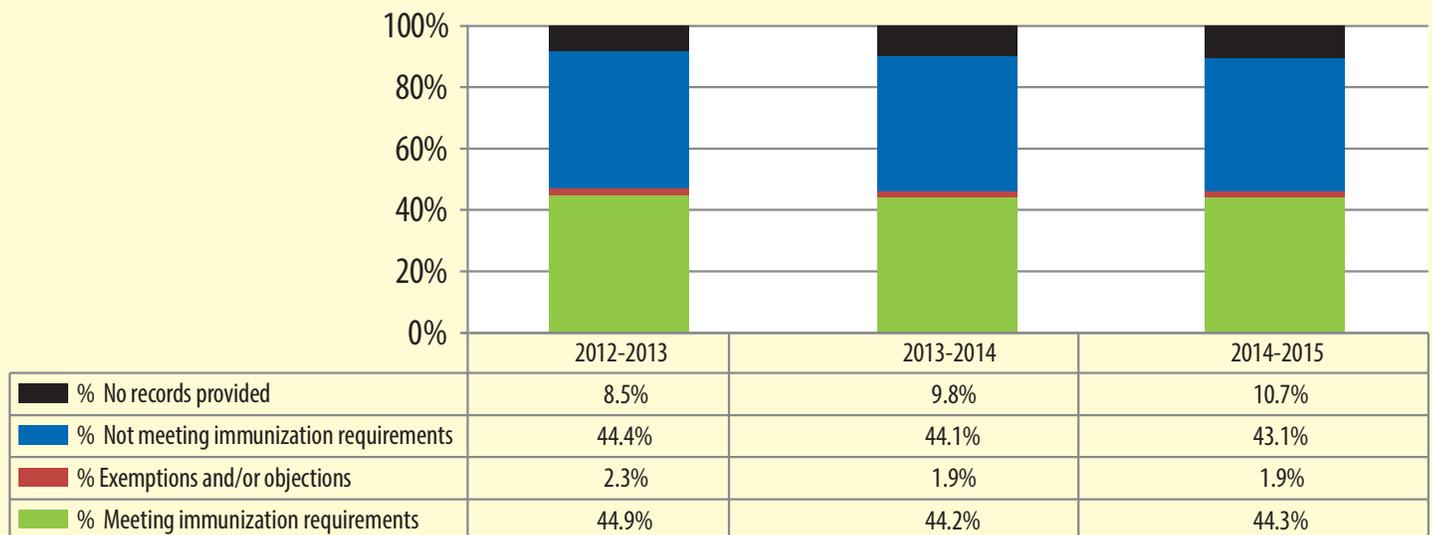
The Department of Education and Early Childhood Development works with the regional health authorities (RHAs) to ensure proof of immunization of all children entering school for the first time. The report shows that 72.6 per cent and 76.8 per cent of children entering school met immunization requirements for 2012-13 and 2013-14, respectively. In 2014-15, there was a decrease in the proportion of children meeting requirements through immunization, to 69.1 per cent. One factor contributing to this decrease may be the inclusion of an additional varicella dose in the definition of being up-to-date in 2014-15; i.e., two doses of varicella vaccine were required to be up-to-date in 2014-15 versus only one dose in 2013-14.

Figure 1: Immunization record status of students entering kindergarten, by RHA zone and for New Brunswick, 2014-15.



During the past three years, an average of 44.5 per cent of the infants and preschoolers (i.e., children up to four or five years of age) attending a licensed daycare did meet immunization requirements.

Figure 2: Immunization record status for age of children attending daycare in New Brunswick, 2012-13, 2013-2014 and 2014-15.



Key points for immunization providers

- Be a champion for immunization!
- Follow immunization schedules and standards.
- Provide updated and complete immunization record to parents.
- Remind parents to give copy of record to school/daycare.

Physicians and nurse practitioners are champions

Immunization providers can improve the proportion of children meeting immunization requirements by:

- educating and promoting immunization to parents;
- ensuring records are accurate and complete; and
- administering vaccines according to the New Brunswick routine immunization schedule and guidelines.

Literature has demonstrated that parents trust their family physicians to provide advice and credible knowledge about immunization; therefore, health-care professionals are key to instilling vaccine confidence. [2,3] Every office visit is an opportunity to discuss the important protection that immunizations provide and the proven safety of vaccines.

The data summarized in the [Daycare, School Entry and School Program Immunization Report](#) was collected from the RHAs through a provincial reporting tool that contained aggregate-level regional information. Since the data rely on the child's personal immunization record, it is important that the record is up-to-date with the following information:

- the date on which the vaccine was administered;
- the name of the vaccine; and
- the signature of the person who administered the vaccine.

Health-care professionals can make a difference by ensuring that each parent receives an updated immunization record (Green Cards are supplied by the provincial government) and is aware of the importance of providing this record to the school or daycare as soon as possible.

Following a standard schedule and evidence-based practice guidelines provides the maximum level of protection that can be obtained through immunization. The [New Brunswick Routine Immunization Schedule](#) [4] is the intended standard for the routine immunization of infants, children and adults. The [New Brunswick Immunization Guide](#) [5] provides direction to all health-care practitioners as it outlines legislation, policies and standards necessary in the provision of a safe, effective and competent immunization practice. Some examples of best practices include:

- using the proper needle length to administer a vaccine (ensures maximum absorption and an

optimum immune response);

- following the recommended intervals between doses of vaccines (guarantees the validity of vaccine doses).

The New Brunswick Immunization Guide is to be used in conjunction with the [Canadian Immunization Guide](#). [6] In addition, the [National Advisory Committee](#) [7] on Immunization produces excellent resources.

In conclusion, it is important that provincial statistics reflect New Brunswick children's true immunization status so that informed decisions are made to maintain a safe and effective immunization program that provides the best possible protection for the public. This requires the efforts of all health-care providers to promote immunization, follow best practices and provide accurate records.

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Immunization offers the best protection against pertussis

Overview

Before vaccines, pertussis was a major cause of mortality and illness among children. The introduction of the whole-cell pertussis vaccine in the 1940s and 1950s in industrialized countries dramatically decreased the incidence of pertussis. Concerns about side-effects led to the development of more purified (acellular) vaccines associated with a lower frequency of adverse reaction. [1] In 1997-98, acellular pertussis vaccines replaced the whole-cell vaccine in Canada. [2]



Despite the availability of vaccination, pertussis continues to be a problem around the world, even in regions with high vaccination coverage. Pertussis is a cyclical illness with peaks in activity occurring in two to five year cycles. [3] In 2012, New Brunswick experienced the largest outbreak of pertussis in more than 18 years, with 1,421 confirmed cases reported to Public Health. On Oct. 1, 2015, another pertussis outbreak was declared in Health Region Zone 1 (Moncton and surrounding area); 59 confirmed cases were reported from July 1, 2015, to Nov. 23, 2015, which was almost four times the average number expected annually for the entire province (five-year average for New Brunswick is 16 cases, of which 11 are expected to occur in Zone 1).

Routine immunization

Immunization is the best way to protect against pertussis. Immunity from the vaccine may decrease over time, however, so boosters are required periodically.

In New Brunswick, a combined acellular pertussis vaccine is offered to children, adolescents and adults according to the routine immunization

schedule. The amount of acellular pertussis antigen present varies per product. Preparations containing higher concentrations of acellular pertussis antigen (designated as aP) are administered for primary immunization of infants and children younger than seven years of age. Preparations containing a lower concentration (designated as ap and referred to as “reduced”) are recommended for older children (may be administered as preschool booster), adolescents and adults:

- *DTaP-IPV-Hib*: (Diphtheria, tetanus, acellular pertussis, inactivated polio, Haemophilus influenzae type b): two, four, six and 18 months of age (primary series).
- *Tdap-IPV*: (Tetanus, diphtheria-reduced, acellular pertussis, inactivated polio): four years of age (preschool booster).
- *Tdap*: (Tetanus, diphtheria-reduced, acellular pertussis): students in Grade 7 and adults (one dose of pertussis containing booster in adulthood).

Pregnant women 26 weeks gestation or greater, who have not received a dose of a pertussis-containing vaccine in adulthood, should be encouraged to receive *Tdap* vaccination prior to delivery.

Practice points – outbreaks

- The National Advisory Committee on Immunization (NACI) does not recommend **Tdap** vaccination in every pregnancy given the current epidemiology in Canada. [4]
- In special circumstances such as an outbreak, however, all pregnant women who are 26 weeks gestation or greater may be offered *Tdap* vaccination irrespective of their immunization history (**even if they previously received an adult *Tdap* booster**) based on recommendations from local Public Health officials.[4] Outbreaks may be region specific or province-wide, and recommendations should be issued accordingly.
- When an outbreak is occurring, the main goal is to protect vulnerable infants younger than one year of age and reduce the burden of disease in other age groups. Strategies include ensuring that everyone, especially close contacts with infants and children, is up-to-date with immunizations.

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Investigation and management of patients when evaluating potential health effects associated with arsenic

With public concern about environmental exposures, testing for arsenic is often requested by patients and provided by health-care providers. [1]

If you are considering testing for any specific metal including arsenic, consider several questions beforehand:

- Is this a health concern for my patient (are there compatible symptoms/signs or a likely source of exposure)?
- Is this the right test and sample medium (blood, urine, etc)?
- Is this the right collection time relative to the suspected exposure?
- Are there any special preparations required? If an elevated value is reported, what is the relevance of the result? Reference values need to be used with care in determining if the result is indicative of a health concern.

Testing is not recommended for asymptomatic persons unless there is evidence of a specific source and route of arsenic exposure.

Health effects:

In Canada, a guideline has been established at 10 µg/l of drinking water. [2] The guideline is based on a lifetime exposure (daily ingestion over 70 years) to arsenic from drinking water. Dermal lesions, such as hyperpigmentation, warts and hyperkeratosis of the palms and soles, are the most commonly observed symptoms resulting from high-level exposures. For example, dermal lesions in 70-kg adults have been reported after five to 15 years of exposure equivalent to 700 µg/day

or within six months to three years at exposures equivalent to 2,800 µg/day. [3]

Arsenic is classified as a human carcinogen (Group I). The excess cancer risk associated with lifetime arsenic exposure at water concentrations of >10 µg/l is about 1 in 300. [4]

Toxic form: Inorganic arsenic is the form of most concern for potential toxicity; organic arsenic stems mainly from dietary exposure (especially seafood), and it is generally accepted that these forms are less toxic than inorganic arsenic. A request for inorganic analysis is more clinically relevant than organic or total arsenic.

Sources of exposure: Arsenic is a natural element found widely in the Earth's crust. For most Canadians, the primary source of exposure to arsenic is food (organic arsenic), followed by drinking water, soil and air.

Arsenic toxicity is rare in Canada largely due to regulation of its use in situations where exposure could occur. Human exposure occurs mainly through the consumption of groundwater containing naturally high levels of inorganic arsenic, food prepared with this water and food crops irrigated with high-arsenic water sources. It may be found in some drinking water supplies, including wells. Arsenic can be released into the atmosphere and water by natural activities, such as volcanic activity, dissolution of minerals (particularly into groundwater), exudates from vegetation and wind-blown dusts; and human activities, such as mining, metal smelting, combustion of fossil fuels, agricultural pesticide production and use, and timber treatment with preservatives.

Table 1: Short-term and long-term health effects of arsenic [2]

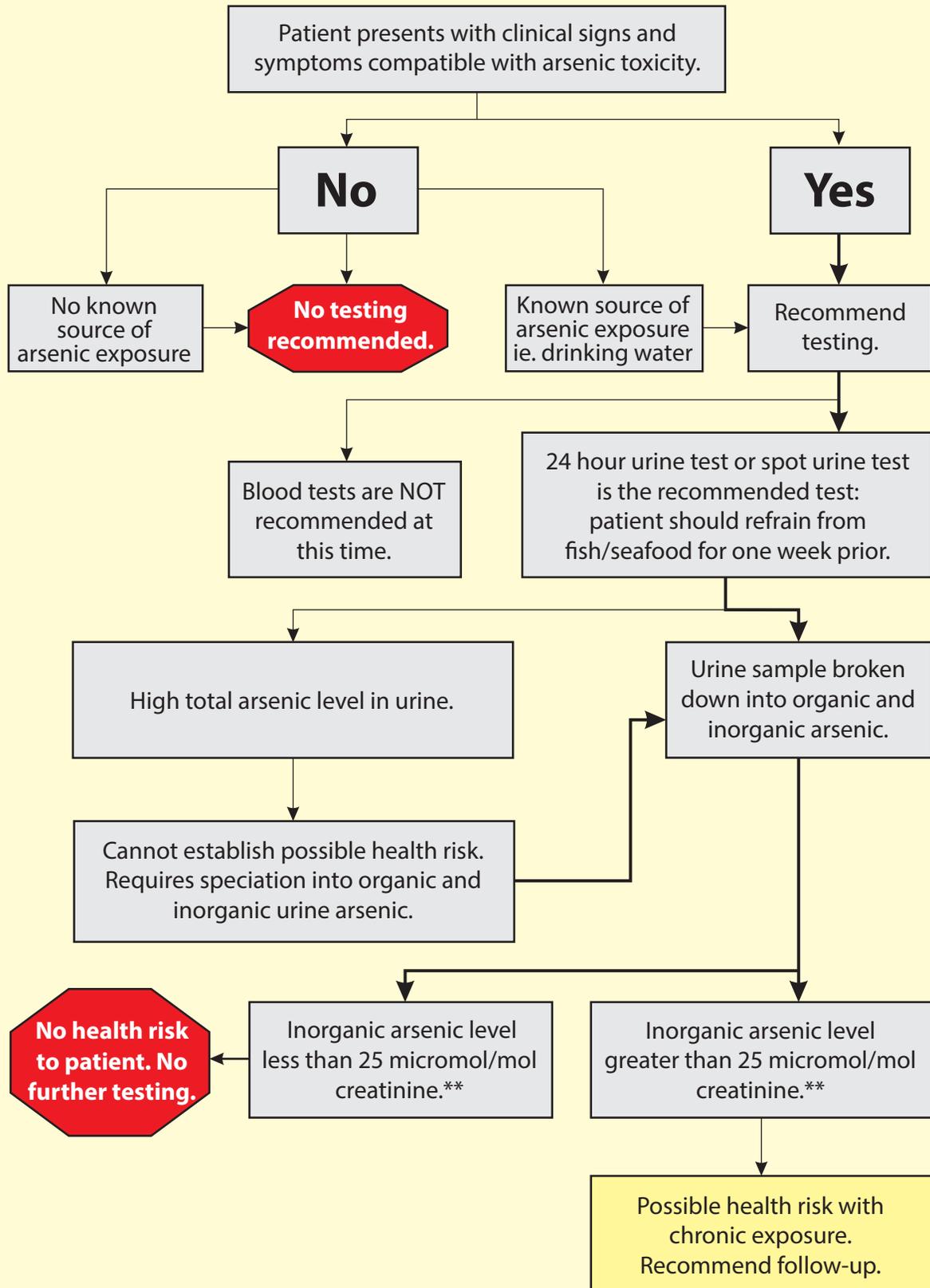
Short-term exposure (days/weeks) to very high levels of arsenic*	
Gastro-intestinal	abdominal pain, vomiting and diarrhea
Musculoskeletal	muscular cramping or pain
Neurological	numbness, burning or tingling sensation or pain in hands and feet, weakness
Dermatological	- flushing of skin, skin rash - thickening of the skin on the palms of the hands and soles of the feet
Long-term exposure (over many years or decades) to high levels of arsenic*	
Dermatological	thickening and discoloration of the skin
Gastro-intestinal	nausea and diarrhea
Blood and lymphatics	decreased production of blood cells
Cardiovascular	abnormal heart rhythm and blood vessel damage
Neurological	numbness in the hands and feet
Cancer	skin and internal organ (bladder, kidney, liver, lung)
*high levels in drinking water (more than 0.35 ppm)	

Testing: Tests can help confirm clinical suspicion if a patient presents with symptoms (see Table 1) or has a history compatible with arsenic intoxication. Measurement of urinary arsenic levels is generally accepted as the most reliable indicator of recent exposure. [5] It is recommended that you order a first morning urine spot test or, ideally, 24-hour urine. Urine is a more useful measure of exposure than blood because the half-life of arsenic in blood is very short. Urine levels can remain high for weeks after an acute exposure, and only urinary arsenic can be speciated into the organic and inorganic fractions. Testing should be performed after one week of dietary abstinence from seafood (including salmon). Urine results are corrected for diurnal and renal function variation by testing for creatinine. Tests of hair or fingernails can determine exposure to high levels of arsenic during the past six to 12 months, but these tests are not useful in detecting low-level exposures. Prior to testing, the reference laboratory should be contacted to clarify the need for special preparation before specimen collection occurs.

Interpreting results: Elevated total arsenic often provides misleading results. [1]. Once an elevated result is received, it is important to understand how the laboratory determines its reference values to assess potential adverse health impacts. Inorganic arsenic is the toxic form that is of most concern (see algorithm). An inorganic arsenic level greater than 25 micromol/mol creatinine (see algorithm) indicates there is a possible health risk and follow-up is necessary. [6]

Conclusion: A comprehensive review of the literature on arsenic is beyond the scope of this article. You may wish to contact your local Public Health office for more information. Public Health may facilitate environmental investigation and testing if appropriate to help clarify the source of the exposure. You may also wish to consult the article [Heavy Metals Testing in Clinical Practice](#) published in a previous Disease Watch Bulletin [7] or obtain a [fact sheet](#) from the Department of Health to inform your patients. [8]

Figure 1: Algorithm for testing patients for arsenic



** Reference values for laboratory tests are based on those from In-Common Laboratories (Ontario), www.hicl.on.ca and are not intended for tests done at any other laboratory.

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Norovirus Infection – preventing outbreaks

Public Health offices across New Brunswick continually investigate outbreaks of enteric illness in schools and daycares.

The outbreaks start with one or two children being out sick. Over a few days, entire classes of children and staff become ill. This often reflects wider illness activity in the community. Primary symptoms include diarrhea, nausea and vomiting, and they may include abdominal pain, myalgia, headache, malaise, low-grade fever or a

combination of these. As with many illnesses, the impact can involve lost learning time, lost wages for parents and caregivers and serious illness in the most vulnerable.

Norovirus infection is frequently the cause of this disruption. Norovirus infection, although often self-limiting, can result in severe illness and hospitalization, especially among the very young and elderly. As the symptoms are similar to other enteric diseases, such as Salmonella or E.coli O15H7, all enteric clusters of illness have to be diligently investigated until the cause is determined to be positive noroviral infection or another enteric illness – often by detection of the organism in a stool sample.

Because norovirus infection is primarily spread through the fecal-oral route and is highly contagious, it is important to remind suspect or confirmed cases, parents and caregivers, that one of the best ways to prevent outbreaks is to exclude those who are ill, including themselves or their children from daycare, school or work for at least 48 hours after symptoms resolve.[1] Vigilant and proper handwashing is also important, in conjunction with enhanced cleaning and sanitizing of common surfaces.

- Guidelines for school exclusion for this and other diseases may be found at: <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/HealthProfessionals/SchoolExclusionGuidelines.pdf>
- More information about norovirus infection may be found at: <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/FactSheets/Norovirus.pdf>

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