

New Brunswick Disease Watch Bulletin

New Brunswick's immunization partners working together to improve influenza vaccine uptake

With the Victorian Order of Nurses (VON) ceasing operations in New Brunswick in 2015, the Department of Health is requesting the assistance of all health-care providers to ensure that children younger than five and groups for which the influenza vaccine is publicly funded have access to immunization services.

For the 2016-2017 influenza season, the Department of Health will be offering quadrivalent influenza vaccine, which provides protection against four different influenza viruses; two influenza A viruses and two influenza B viruses.

The publicly funded influenza vaccines will include two products: Flulaval® Tetra and Fluzone® Quadrivalent, which contain the following strains:

- A/California/7/2009 (H1N1) pdm09-like virus;
- A/Hong Kong/4801/2014 (H3N2)-like virus;
- B/Brisbane/60/2008-like virus;
- B/Phuket/3073/2013-like virus.

Office of the Chief Medical Officer of Health

Highlights of the 25th Edition

- Tis the season – Give the flu shot! 1
- Rapid testing for influenza 2
- NB SPIN team 3
- Climate change graphic 4
- Food insecurity screening 4
- 2015-2016 Influenza review 6
- Post immunization testing for hepatitis 8

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/content/gnb/en/departments/ocmoh/publications.html>



The most effective way of reducing the impact of seasonal influenza, especially for those most at risk of complications, is

immunization. It is important that health-care providers work together to increase public awareness of the benefits, safety and effectiveness of influenza immunization and to ensure that those at highest risk and those caring for them (including health-care professionals) get immunized.

Tips for obtaining faster influenza laboratory results

Laboratory tests are a common part of the diagnostic process for influenza. However, it can take several days between the collection of the clinical specimen and receipt of the result. This delay can be problematic, especially in the case of a patient with respiratory distress or during outbreaks. A faster laboratory result would enable timely administration of antiviral medication, which could prevent serious symptoms and protect people from becoming infected. In this article, we will examine the system for influenza testing in New Brunswick, outline some issues that could affect the turnaround time and provide some ways to minimize test delays.

New Brunswick laboratory testing for influenza:

The most common diagnostic test for influenza is PCR (polymerase chain reaction), which detects viral genetic material from a clinical specimen. The test is centralized at the Dr. Georges-L-Dumont University Hospital Centre. Specimens are shipped there from hospital laboratories around the province. Once processed, the result is sent to the source laboratory before it is communicated to the requesting physician. During peak influenza season, testing is performed every day.

Issues affecting the turnaround time:

The biggest factor affecting turnaround time is transport delay for the specimen to be shipped from the source laboratory to the Dr. Georges-L-Dumont laboratory. Shipping time from the hospitals to the testing laboratory varies by location, but can take anywhere from the same day to a full week. Transport is not universally available during the weekend and weather conditions during the winter may affect the shipping schedule. During peak influenza season or during large outbreaks, the volume of specimens can potentially be higher than the testing capacity of the laboratory. In those cases, non-urgent specimens may be delayed further.

Getting urgent specimens tested more quickly:

1- Inform the laboratory staff

The most important step is to indicate on the laboratory requisition when a sample is from a critically ill patient or is potentially part of a facility outbreak (long term care facility, school, etc). Recent international travel or unusual presentation should also be identified. This will allow the laboratory to prioritize the sample ahead of all non-urgent samples. Calling the laboratory before sending a specimen could also be helpful, so that the shipping or testing schedule could be modified if possible to make sure the specimen is included.

2- Point of care testing

Some facilities and laboratories have set up point of care testing or rapid influenza diagnostic tests (RIDT) to obtain a quicker result than sending specimens offsite. We define RIDT as any self-contained testing apparatus designed to perform laboratory testing for the influenza virus from a clinical specimen. They offer quick results and simplicity of use compared to traditional PCR testing or viral culture. However, they do not offer the same sensitivity, which can lead to false negatives. Using the PCR as gold standard, analysis of multiple RIDTs has shown the sensitivity varies from 40 per cent to 95 per cent. However, specificity was high (ranging from 93 per cent to 99 per cent) meaning that an influenza positive result is very likely to be a true case of influenza. [1,2]

There are multiple brands of RIDTs all with their individual specifications: however overall, the factors influencing the sensitivity the most are the viral load of the specimen and the type and subtype of the influenza virus in the specimen. All situations affecting the viral load of a test sample (patient already vaccinated against the flu, age of the patient and collection of the specimen too early or too late) augment the risk of a false negative, so in potential outbreaks efforts should be made to collect specimens from patients with the most prominent symptoms. [1,3] The overall flu activity also seems to affect the likelihood of a false positive or a false negative, depending on the influenza season as seen on the interpretation table. [4]



Interpretation table:			
RIDT test result	Influenza peak season	Possibility of influenza	Comments
Positive	Yes	Highly likely	Can take action prior to PCR confirmation
Positive	No	Likely	Cannot exclude false positive
Negative	Yes	Unlikely	Cannot exclude false negative
Negative	No	Highly unlikely	Still requires a PCR confirmation test

Because of their limitations, point of care testing is not ideal for all situations. We recommend using RIDT in situations where a quick diagnosis is necessary for immediate decision-making or in outbreaks or possible outbreak situations. Otherwise, PCR remains the most accurate testing method.

References:

- Centers for Disease Control and Prevention (CDC). Evaluation of 11 commercially available rapid influenza diagnostic tests – United States, 2011-2012. *MMWR Morb Mortal Wkly Rep* 2012;61(43):873-6
- Chartrand C, Leeflang MM, Minion J, et al. Accuracy of rapid influenza diagnostic tests : a meta-analysis, *Ann Intern Med.* 2012;156:500-11
- Tanei M, Yokohama H, Murai K et al. Factors influencing the diagnostic accuracy of the rapid influenza antigen detection test (RIADT) : a cross-sectional study. *BMJ Open* 2014;4:e003885
- Harper SA, Bradley JS, Englund JA et al. Seasonal Influenza in Adults and Children Practices Guidelines of Treatment, Chemoprophylaxis and Institutional Outbreak Management: Clinical Practices Guidelines of the Infectious Diseases Society of America. *Clin Infect Dis* 2009;48(8):1003-32

Thank you NB SPIN Colleagues!

The New Brunswick influenza surveillance system allows Public Health to monitor, detect and respond to changes in influenza activity, morbidity, mortality and quickly identify novel strains. A key contributor to influenza surveillance is the New Brunswick Sentinel Practitioner Influenza Network (NB SPIN). NB SPIN sites are composed of volunteer physicians, nurse practitioners and nurses who work in several health-care settings (e.g., ER, walk-in clinics, nursing homes, physician offices, community health centres, university clinics and clinics in First Nations communities) across the province. Once a week, sites submit information on the number of patients with influenza-like-illness (ILI), and they also obtain laboratory specimens for patients with symptoms consistent with ILI.

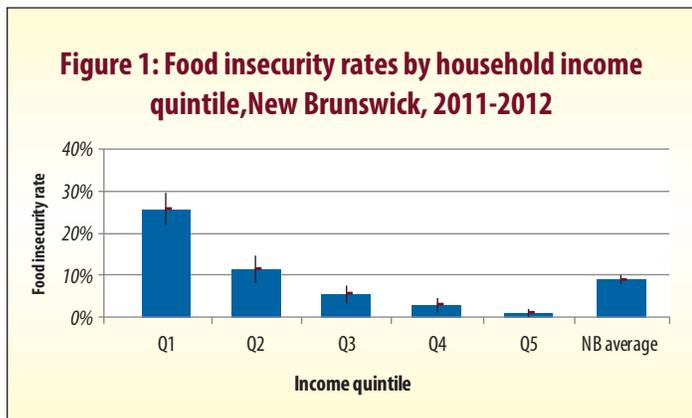


We thank all our sentinel sites who have participated in our NB SPIN Program this past season as well as in previous seasons. Your valuable contribution is recognized and appreciated.

If you are a primary health-care practitioner and are interested in becoming a NB SPIN member for the 2016-2017 season, contact us at CDCUnit@gnb.ca. Information about NB SPIN is also available in the Health Professional section of the Office of the Chief Medical Officer of Health website: http://www2.gnb.ca/content/gnb/en/departments/ocmoh/for_healthprofessionals/cdc.html



Earlier this year, the Office of the Chief Medical Officer of Health released the *Health Inequities in New Brunswick* report demonstrating that food insecurity disproportionately affects low-income New Brunswickers. [3] Figure 1 shows in 2011-2012, 25 per cent of households in the lowest income group experienced food insecurity compared to one per cent of households in the highest-income group. Food insecurity is most prevalent in households with children younger than 18, particularly those headed by single mothers. One in four children lives in food insecure households in New Brunswick compared to one in six Canadian children. [4]



A large proportion of households experiencing food insecurity are working poor households with low incomes or inconsistent employment, and households reliant on government income assistance. [5] Poverty is not the only risk factor for food insecurity. New immigrants, people who lack food skills, pensioners, university students and people with limited mobility are also at risk. [6]



Recognizing food insecurity is the first step in being able to consider the impact that it can play on a patient's health and treatment options. Box 1

provides a validated food insecurity screen that can be used to help identify patients experiencing food insecurity. [7] There are a variety of resources available in New Brunswick communities that can help food-insecure patients obtain food, such as food banks, soup kitchens, Meals-on-Wheels programs, prenatal benefit programs and bulk food buying clubs. These initiatives can help ease the immediate need of providing food to individuals and families. However, as figure 1 illustrates, low income is the strongest predictor in food insecurity.

Longer-term strategies that can help relieve the symptoms of food insecurity include employment counselling and accessing income support programs. [8] Existing income supports are often insufficient therefore, advocating for social policy reforms to improve income support and minimum wage could make the most lasting difference to families experiencing food insecurity. [9]

1. Screening for food insecurity

The following two-question screen can assist in assessing the stress of food insecurity on individuals or families. Affirmative answers to either question identified food insecurity with a sensitivity of 97 per cent and specificity of 83 per cent. [7]

1. Within the past 12 months, we worried whether our food would run out before we got money to buy more (Yes or no)
2. Within the past 12 months, the food we bought just did not last and we did not have money to get more (Yes or no)

2. Building food access: The Plaster Rock Community Health Centre example

The Plaster Rock Community Health Centre has been operating an inclusive bulk buying club for vegetables and fruit that is available to all community members. The Community Health Centre also maintains a community garden in the summer and partners with other community organizations to conduct educational events around food skills.



3. Resources to support food insecure patients

Examples of community food resources:

- Prenatal Benefit Program
- New Brunswick Association of Food Banks
- New Brunswick Food Security Action Network
- Community Food Action Program

Examples of income support resources:

- Postnatal Benefit Program
- Regional Social Development offices
- Economic and Social Inclusion Corporation
- Community Inclusion Networks
- Canada Child Benefit
- Community Volunteer Income Tax Program

References:

1. PROOF Food Insecurity Policy Research. The impact of food security on health [Internet]. 2016 [cited 22 September 2016]. Available from: <http://proof.utoronto.ca/wp-content/uploads/2016/06/health-impact-factsheet.pdf>
2. Vazoris NT, Tarasuk VS. Household food insufficiency is associated with poorer health. *J Nutr*. 2003 Jan 1; 133(1):120-6.
3. Office of the Chief Medical Officer of Health. Health inequities in New Brunswick. New Brunswick Department of Health, February 2016. <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/Publications/HealthInequitiesNewBrunswick2016.pdf>
4. PROOF Food Insecurity Policy Research. Children in food insecure households [Internet]. 2016 [cited 22 September 2016]. Available from: <http://proof.utoronto.ca/wp-content/uploads/2016/07/children-food-insecurity-factsheet.pdf>
5. Dietitians of Canada. Prevalence, severity and impact of household food insecurity: a serious public health issue. August 2016. Available from: <http://www.dietitians.ca/Downloads/Public/HFI-Background-DC-FINAL.aspx>
6. Rideout K, Kosatsky T. Food insecurity: a public health issue for BC. *BCMJ*. 2014 January, February; 56(1):29-30.
7. Hager ER, Quigg AM, Black MM, Coleman SM, Heeren T, Rose-Jacobs R, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010 July; 126(1):e26-32.
8. Roncarolo F, Potvin L. Food insecurity as a symptom of a social disease. *Can Fam Physician*. 2016 April; 62:291-2.
9. PROOF Food Insecurity Policy Research. Public policy and food insecurity [Internet]. 2016 [cited 22 Sep-

2015-2016 influenza season: Higher than expected influenza hospitalization in children younger than five

The 2015-2016 influenza season analysis findings emphasize the importance of vaccinating those at high risk of influenza-related complications to reduce morbidity and mortality. Overall, among all hospitalized influenza patients who were not vaccinated (n=109), 94 per cent would have been eligible to receive publicly funded seasonal influenza vaccine as they were considered meeting the New Brunswick high-risk eligibility criteria; i.e., children between six months and 18 years old, people 65 years and older, persons having any co-morbid condition, being pregnant, being a First Nation or residing in a nursing home. [1] In addition, there was a greater proportion of influenza hospitalizations in children younger than five years of age.

The 2015-2016 influenza season in New Brunswick was an average season regarding the number of influenza cases reported (Figure 1). Influenza activity started later than usual and remained high until mid-May, with a peak around the end of March. This late start was also observed on the national level (FluWatch). Up to June 4, 2016 in New Brunswick, 1,207 laboratory-confirmed influenza cases were reported (1,055 influenza A and 152 influenza B) with 243 hospitalizations including 54 ICU admissions and 18 deaths.

The National Microbiology Laboratory (NML) recorded that the predominant circulating strain was Influenza A (H1N1) pdm09 [1]; this strain has usually a particular preference to infect and cause severe complications in children, young and middle-aged adults. [2]

In New Brunswick, adults 20 to 64 years old accounted for 52 per cent of the laboratory-confirmed influenza cases and 39 per cent of all influenza hospitalizations. Children five years old and younger accounted for 17 per cent of laboratory-confirmed influenza cases and 16 per cent of all influenza hospitalizations (Figure 2). This later proportion is of particular interest, as it was significantly higher compared to proportions observed during both the 2014-2015 season (with H3N2 predominant strain) and the 2013-2014 season (with H1N1 pdm09 predominance) when four per cent (16/443) and eight per cent (22/265) of all



Figure 1. Number and percent of positive influenza specimens in New Brunswick by week, up to June 4, 2016
(source: laboratory results from the Georges L. Dumont University Hospital Centre)

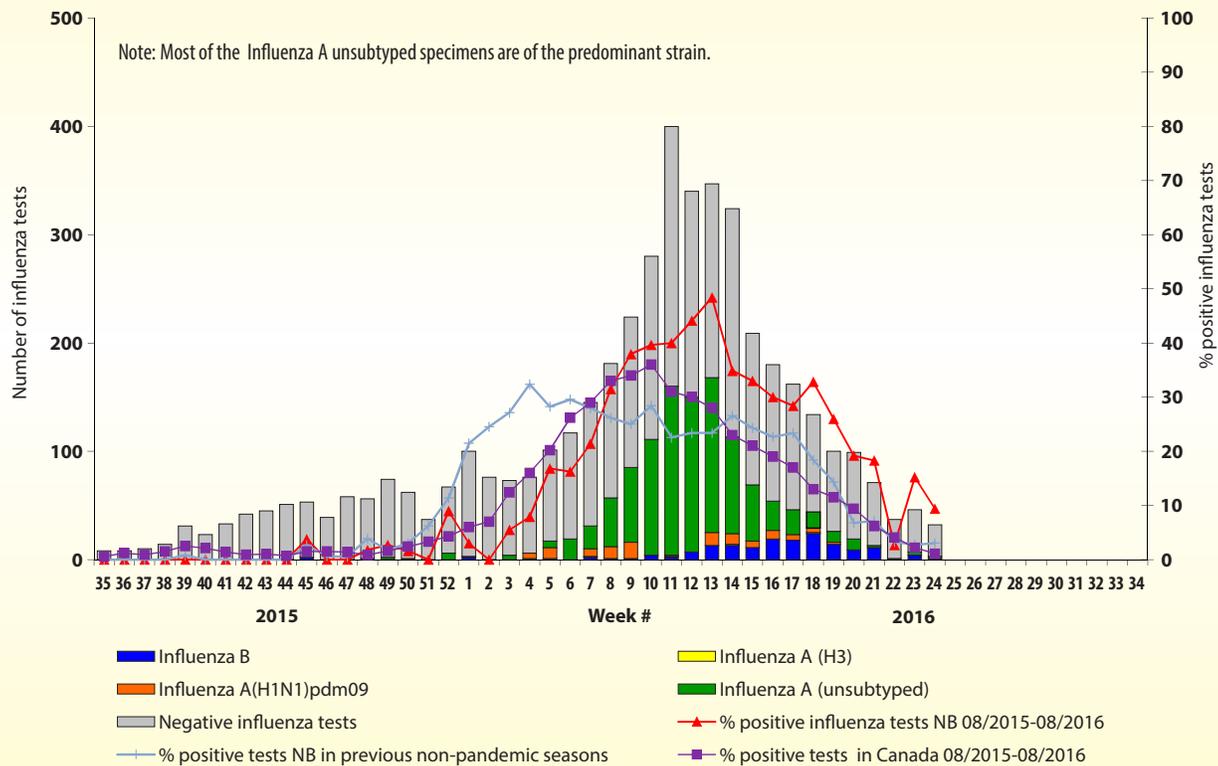


Figure 2. New Brunswick influenza-related hospitalizations, ICU admissions and deaths by age group, Influenza season 2015-2016 (data up to June 4, 2016)

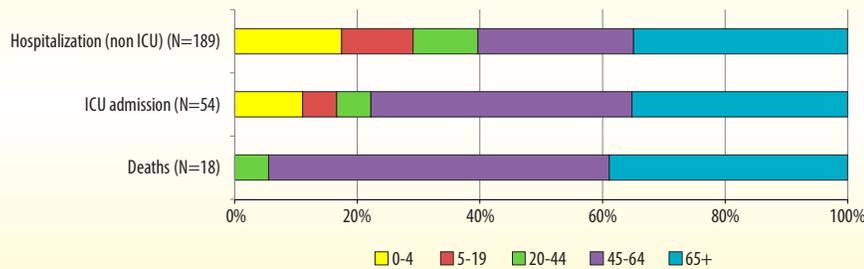
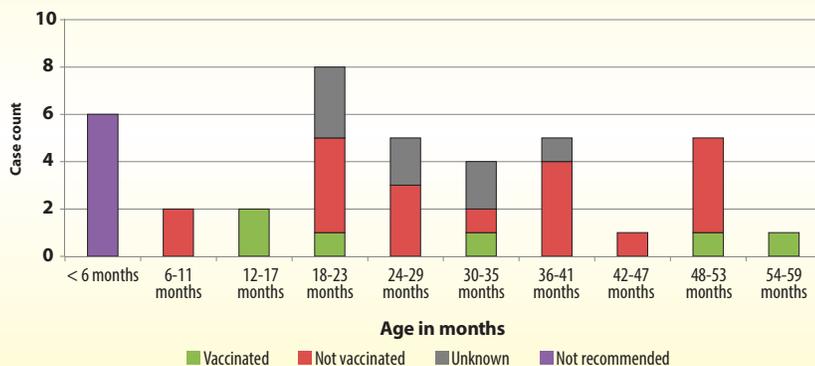


Figure 3. Number of hospitalized children younger than five years old, by age group in months and vaccination status, in New Brunswick (N=39) (data up to June 4, 2016)



hospitalizations respectively were observed in children younger than five years old.

With a closer look on this subgroup of pediatric hospitalized cases (children younger than five years old, n=39), they had a median age of two years old and a median length of hospitalization of two days (range of one to nine days). Ten children had co-morbid conditions, of whom four had bronchial asthma. Six children were younger than six months old, and could not get the influenza vaccine. Of the younger-than-five hospitalized children, who could be vaccinated and had their vaccination status reported (n=25), 76 per cent had not received the vaccine and all would have been eligible to receive the publicly funded vaccine (Figure 3)!

In the 2015-2016 season in Canada, both circulating influenza virus A and B strains were antigenically similar to the strains included in the influenza vaccine. [3] Preliminary adjusted vaccine effectiveness against medically



attended, laboratory-confirmed predominant influenza A(H1N1)pdm09 illness was estimated to be 64 per cent (95 per cent CI: 44 per cent to 77 per cent) [4].

Health-care professionals are encouraged to offer influenza vaccines to all their patients who fit the New Brunswick eligibility criteria, including themselves!

For more details about the 2015-2016 Influenza season, refer to New Brunswick Influenza Activity Summary Report: 2015-16 season: <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/Influenza/InfluenzaActivitySummaryReport2015-2016.pdf>

and the Weekly New Brunswick influenza reports: http://www2.gnb.ca/content/gnb/en/departments/ocmoh/cdc/content/influenza/influenza_surveillance_activities.html

References:

1. Government of New Brunswick. Seasonal influenza vaccine fact sheet ("Flu shot"). 2016 Retrieved from <http://www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/FactSheets/SeasonalInfluenza.pdf>
2. Centers for Disease Control and Prevention. CDC Influenza Division Key Points 2016. CDC, 2016. Retrieved from <http://www.izsummitpartners.org/content/uploads/2016/04/CDC-Flu-Key-Points-04-01-2016.pdf>
3. Public Health Agency of Canada. FluWatch report: August 14 to August 27, 2016 (weeks 33-34). Public Health Agency of Canada, 2016. Retrieved from: <http://healthycanadians.gc.ca/publications/diseases-conditions-maladies-affections/fluwatch-2015-2016-33-34-surveillance-influenza/index-eng.php>
4. Chambers C, Skowronski DM, Sabaiduc S, Winter AL, Dickinson JA, De Serres G, Gubbay JB, Drews SJ, Martineau C, Eshaghi A, Kraiden M, Bastien N, Li Y. Interim estimates of 2015/16 vaccine effectiveness against influenza A(H1N1)pdm09, Canada, February 2016. Euro Surveill. 2016;21(11):pii=30168. DOI: <http://dx.doi.org/10.2807/1560-7917.ES.2016.21.11.30168>

How do I interpret serologic testing for hepatitis B following vaccination?

Serologic testing of infants and children is not recommended after they receive a hepatitis B (HB)-containing vaccine under routine infant and childhood programs. It is not uncommon, however, for serologic testing to be requested later on for various reasons. Given that most New Brunswickers are routinely vaccinated early in life, this can present interpretation challenges.

As a rule, absence of a protective antibody titre in a healthy person who has previously demonstrated an adequate anti-HBs titre or who has been immunized for more than six months does not mean a lack of protection because immune memory persists. Evidence shows that immunity is long lasting even though the antibody may be undetectable. However, the Canadian Immunization Guide specifies certain groups of people who should have post-immunization serology due to increased susceptibility or exposure (see Table 1).

Canadian Immunization Guide: <http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/4-canadian-immunizationguide-canadien-immunisation/index-eng.php?page=7#p4c6a7>

Table 1: Groups for which post-immunization serologic testing is recommended	
1	Immunocompromised persons. Periodic monitoring of the anti-HBs titre should also be considered, taking into account the severity of the immunocompromised state and whether the risk of HB is still present.
2	Persons with chronic renal disease or who are on dialysis. Anti-HBs titres should also be evaluated yearly.
3	High-risk pregnant women who are immunized before or during pregnancy.
4	Infants born to infected mothers should be tested for HBsAg and anti-HBs one month after completion of the vaccine series.
5	Persons with potential percutaneous or mucosal exposure, such as men who have sex with men and injection drug users.
6	Sexual partners and household contacts of acute cases and chronic carriers of HB.
7	Workers who have been immunized because of risk of occupational exposure such as health-care workers.

The ideal period in which to test for post-immunization immunity is one to six months following completion of the HB vaccine series. If the



anti-HBs titre is done earlier than one month after a vaccine has been administered, hepatitis B surface antigen (HBsAg) may be positive, but this would most likely be due to the antigen in the vaccine. Testing would need to be repeated at least one month after immunization.

An anti-HBs titre of 10 IU/L or above after the three-dose series indicates the person is adequately protected. However, if the anti-HBs titre is below 10 IU/L interpretation depends on when the screening was done.

Interpretation of anti-HBs titres below 10 IU/L:

1. If the anti-HBs titre was done one to six months after completion of the three-dose series, the person is considered a non-responder (negative result) or a weak responder (result between 1 and 9 IU/L).

For the non-responder, it is recommended to give another complete three-dose series and retest for anti-HBs one to two months after the last dose. If the titre remains below 10 IU/L, no further vaccine is recommended because it is unlikely additional doses would increase the response.

For the weak responder, you may give a booster dose and retest anti-HBs one to two months afterward. If the titer remains below 10 IU/L, give the two remaining doses to complete the series and retest for anti-HBs one to two months after last dose.

If serology is still below 10 IU/L, no further vaccine is recommended.

2. If the anti-HBs titre was done more than six months after completion of the three-dose series, the person may be a non-responder, a weak responder or a responder.

It is recommended to give a booster dose and test anti-HBs one to two months after. If the titer is at least 10 IU/L, the person is considered a responder and no further vaccine is required. If the titre remains below 10 IU/L, it is recommended to give the two remaining doses to complete the series and test for anti-HBs one to two months after last dose. If the serology is still below 10 IU/L, no further vaccine is recommended.

A three-dose series is recommended for long-term protection if an anti-HBs titre of 10 IU/L or above has been attained after one or two doses. If a recommended HBV immunization schedule has been interrupted, it is not necessary to restart the series: the missed dose should be given at the earliest opportunity and the schedule completed as per Government of Canada recommendations.

Canadian Immunization Guide:

Part 4 – Active Vaccines:

<http://healthycanadians.gc.ca/publications/healthy-living-vie-saine/4-canadian-immunization-guide-canadien-immunisation/index-eng.php?page=7#p4c6a6b>

