

Pneumococcal Conjugate 15-Valent and 20-Valent Vaccines (PCV15 and PCV20) for Adults

Questions and Answers for Immunization Providers – January 2024

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1. What is Invasive Pneumococcal Disease (IPD)?

Invasive pneumococcal disease (IPD) is a major cause of illness and death worldwide. The disease is caused by the bacterium *Streptococcus pneumoniae*, of which 100 different serotypes have been identified, with a smaller subset of serotypes causing the majority of illness in Canada. The bacteria can cause serious and life-threatening infections such as meningitis, septicemia, and pneumonia. Permanent complications of meningitis include brain damage and deafness.^{1,2}

Asymptomatic upper respiratory tract colonization is common, with 20% to 60% of healthy children acting as asymptomatic carriers.³ However, colonization can lead to infection and occasionally can develop into life-threatening IPD. IPD is most common among the very young (children under the age of 5), in older adults (over the age of 65), and in those with underlying medical conditions (of any age).²

2. Which pneumococcal vaccines are currently authorized for use in Canada?

Table 1: Pneumococcal Vaccines Currently Authorized for Use in Canada ²		
Type of Vaccine	Brand Name	Abbreviation
Pneumococcal Conjugate Vaccine	Synflorix	PCV10
	Prenar®13	PCV13
	Vaxneuvance®	PCV15
	Prenar 20™	PCV20
Pneumococcal Polysaccharide Vaccine	Pneumovax®23	PPV23

3. Does PCV20 protect against the same strains as PPV23?

The following table provides an overview of the serotype coverage in each pneumococcal vaccine authorized for use in Canada:

	Serotypes																							
Vaccine	1	3	4	5	6B	7F	9V	14	18C	19A	19F	23F	6A	22F	33F	8	10A	11A	12F	15B	2	9N	17F	20
PCV10	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓												
PCV13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓											
PCV15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓									
PCV20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			
PPV23	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

4. Which pneumococcal vaccines are currently publicly funded for eligible individuals in BC?

In BC, PCV13 and PPV23 vaccines are the only pneumococcal vaccines that are currently **publicly funded** for eligible populations; the following table summarizes groups currently eligible for PCV13 and PPV23:

Vaccine type	PCV13	PPV23
Eligible groups	Healthy infants and children 2-59 months of age	Certain high risk individuals 2 years of age and older (see INDICATIONS section in product specific page for details)
	Children 2-59 months of age who are at high risk of pneumococcal disease (see INDICATIONS section in product specific page for details)	Adults 65 years of age and older
	Children 5-18 years of age (inclusive) who are at high risk of pneumococcal disease due to: <ul style="list-style-type: none"> Asplenia Receipt of HSCT HIV infection Malignant neoplasm (including leukemia and lymphoma) 	Residents of Extended or Intermediate Care Facilities
	Adults at high risk of pneumococcal disease due to: <ul style="list-style-type: none"> Receipt of HSCT HIV infection 	

5. What is the difference between conjugate and polysaccharide vaccines?

Conjugate Vaccines

A conjugate vaccine is a type of vaccine that joins a protein to a polysaccharide antigen in order to improve the immune response to the vaccine. In the case of pneumococcal vaccines, the protein is connected to each of many unique pneumococcal polysaccharide antigens in order to provide protection against these strains.⁷

Conjugate vaccines stimulate T cells and B cells, resulting in a T cell dependent immune response. The antibodies produced include IgG, providing longer protection and immunologic memory compared to polysaccharide vaccines. Conjugate vaccines were primarily and initially designed to generate immunity and immune memory in children < 2 years of age.⁸

Pneumococcal conjugate vaccines offer more durable protection compared to pneumococcal polysaccharide vaccines, and provide a boostable response i.e., these vaccines 'prime' the immune system and subsequent vaccination or exposure results in a memory or anamnestic response.⁴

Polysaccharide Vaccines

A polysaccharide vaccine is a type of vaccine that is composed of long chains of sugar molecules, called polysaccharides, which resemble the surface of certain serotypes of pneumococcal bacteria in order to help the immune system mount a response.⁷

Polysaccharide vaccines stimulate B cells without the help of T cells, resulting in a T cell independent immune response. The antibody made in response to these vaccines is mostly of the IgM class and immunologic memory is not produced. Polysaccharide vaccines are not immunogenic in children < 2 years of age.⁸

Protection induced by polysaccharide vaccines wanes faster (within 5 years of vaccination) compared to conjugate vaccines due to their T cell independent mode of action.⁴

Polysaccharide vaccines have also been associated with hyporesponsiveness (i.e., lower antibody titres against serotypes) with subsequent dosing.⁹ However, this has rarely been demonstrated to affect clinical outcomes. The conjugate vaccines have not been associated with hyporesponsiveness.

6. Is the protection from PCV15 or PCV20 vaccine expected to be better than that offered by the PPV23 vaccine?

Within the class of conjugate vaccines, it is generally preferred to use preparations that are effective against a broader range of serogroups, when possible. In other words, PCV20 is preferred over PCV15, which is in turn preferred over PCV13.²

PCV20 covers close to 90% of serotypes included in PPV23, with the additional benefit of being a conjugate vaccine. Conjugate vaccines are expected to offer more durable protection compared to polysaccharide vaccines.⁴ While the two new PCV15 and 20 conjugate vaccines have been authorized based on immunogenicity data, there is expectation that they will provide protection on par with PCV13 for the shared strains and will offer additional protection against the strains included in the vaccines.⁴

Protection induced by polysaccharide vaccines wanes faster (within 5 years of vaccination) due to their T cell independent mode of action. In contrast, conjugate vaccines induce memory, provide longer duration of protection, and provide the ability for boosting by involving T cells.⁴

7. Will PCV15 or PCV20 vaccine be publicly funded for certain populations in the near future?

Provinces and territories will review the latest National Advisory Committee on Immunization (NACI) advice to determine whether to integrate the new products into their publicly funded programs. In the meantime, they will continue to offer the existing pneumococcal vaccines (Pneumovax®23 and Prevnar®13) to those who were already recommended to receive these.⁴

The decision to publicly-fund a vaccine in BC is based on several factors, including:

- NACI recommendations
- strength of evidence
- local epidemiology
- cost

The provincial Communicable Disease Policy Advisory Committee recommends changes to publicly funded immunization programs, including the addition of new vaccines into the publicly funded immunization program. If the cost is significant, it must also be approved by the BC Ministry of Health.

8. If adults are interested in purchasing a pneumococcal vaccine, which pneumococcal vaccines are recommended by the National Advisory Committee on Immunization (NACI), and for whom?

The following table summarizes and categorizes NACI's recommendations by the strength of their recommendations:

Table 4: SUMMARY OF NACI RECOMMENDATIONS BY STRENGTH ⁴		
PREFERENTIAL RECOMMENDATION		
Age and risk factors for IPD	Immunization history	Recommended vaccine
All adults aged 65+	Not previously vaccinated / vaccination status unknown	1 dose of PCV20
	Previously immunized with PPV23 alone, or PCV13 and PPV in series	1 dose of PCV20 at least 5 years after any prior pneumococcal immunization
Adults aged 50-64 living with risk factors placing them at higher risk for pneumococcal disease	Not previously vaccinated / vaccination status unknown	1 dose of PCV20
Adults aged 18-49 with immunocompromising conditions	Not previously vaccinated / vaccination status unknown	1 dose of PCV20
ALTERNATE RECOMMENDATION		
Age and risk factors for IPD	Immunization history	Recommended vaccine
All adults aged 65+	Not previously vaccinated / vaccination status unknown	PCV15 followed by PPV23
	Previously immunized with PCV13 alone	1 dose of PCV20 if it has been 1 year from the last dose of PCV13
Adults aged 50-64 living with risk factors placing them at higher risk of pneumococcal disease	Not previously vaccinated / vaccination status unknown	PCV15 followed by PPV23
Adults aged 18-64 with immunocompromising conditions	Not previously vaccinated / vaccination status unknown	PCV15 followed by PPV23
USE CLINICAL DISCRETION		
Age and risk factors for IPD	Recommended vaccine	
Adults aged 18-49 with non-immunocompromising risk factors placing them at high risk of invasive pneumococcal disease	No public health recommendations available on the use of PCV15 or PCV20 for this group at this time PCV15 or PCV20 may be considered at clinical discretion	

Notes on Table 4:

- If PCV15 is used, one dose of PPV23 should be given at least 1 year later.⁴
- Individuals who are pregnant and/or breast/chest-feeding can receive pneumococcal immunization without risk.²

9. Can the pneumococcal vaccines be given at the same time as other vaccines?

All pneumococcal vaccines can be given simultaneously with other routine and age-appropriate vaccines, except other pneumococcal formulations. Specifically, the polysaccharide pneumococcal vaccine should not be given concurrently with a conjugate pneumococcal vaccine.²

10. Would those who receive a PCV20 vaccine continue to be eligible for a PPV23 booster?

If a client receives a PCV20 vaccine, a PPV23 booster is not recommended.⁴

Although not all PPV23 serotypes are contained in the PCV20 vaccine, the extent to which this will result in additional cases of IPD at a population level is unclear.⁴ Circulating serotypes change over time.

PCV20 covers close to 90% of serotypes included in PPV23, with the additional benefit of being a conjugate vaccine. Thus, PCV20 may be offered as a single dose without a subsequent dose of PPV23.³

At this time, there are no recommendations for a booster dose of PCV20.

11. How much do these vaccines cost?

The cost of Prevnar 20™ (PCV20) vaccine including pharmacy dispensing fees may range somewhere between \$130 - \$160. Prices can vary from pharmacy to pharmacy. Some private health insurance plans may cover this cost.

References

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