

# Pocket Guide for Immunizers: Pneumococcal Vaccination

The purpose of this pocket guide is to serve as a tool for health care providers to learn more about pneumococcal vaccines, enabling them to make strong recommendations to their patients.



Invasive pneumococcal disease (IPD)—including pneumococcal pneumonia and pneumococcal meningitis—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.

Asymptomatic upper respiratory tract colonization is common, with 20% to 60% of healthy children acting as asymptomatic carriers. 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).**

Highly effective vaccines exist against the *Streptococcus pneumoniae* serotypes that causes the highest burden of disease in Canada. Routine immunization of children is an essential tool to prevent pneumococcal disease, and targeted immunization of at-risk groups, including older adults, provides life-saving protection against this deadly disease.

This pocket guide references recommendations made in the *Canadian Immunization Guide Chapter on Pneumococcal Vaccine* from the National Advisory Committee on Immunization (NACI).

## What vaccines are available?

There are two types of pneumococcal vaccines: conjugate and polysaccharide. Each vaccine protects against defined and specific pneumococcal serotypes.

The conjugate vaccine PNEU-C-20 has been recommended for use in adults aged 18+, but has not yet been authorized for use in pediatric populations.

**Table 1: Preparations Authorized for Use in Canada**

Class Code	Class Details	Vaccine Brand Name	Vaccine Code
PNEU-C	Conjugate vaccines recommended for use (PNEU-C-20 is not authorized for use in pediatric populations)	Pevnar <sup>®</sup> 13	PNEU-C-13
		Vaxneuvance <sup>®</sup>	PNEU-C-15
		Pevnar 20 <sup>™</sup>	PNEU-C-20
PNEU-P	Polysaccharide vaccines	Pneumovax <sup>®</sup> 23	PNEU-P-23

*Note: Throughout the rest of this guide, vaccines will be referred to by vaccine code when there is a specific recommendation within the class, and by class code (or the text “conjugate vaccines” and “polysaccharide vaccines”) when there is not.*

## What is the recommended dosage and how is it given?

For all authorized preparations, dosage is 0.5mL. Conjugate vaccines should be administered intramuscularly (IM). Polysaccharide vaccines may be administered either intramuscularly (IM) or subcutaneously (SC).

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## How do I choose which vaccine to give?

Conjugate vaccines provide longer-lasting protection and are part of the routine childhood immunization schedule in Canada, while the polysaccharide vaccine is generally given (in addition to conjugate vaccines) to those at increased risk of invasive pneumococcal disease (including older adults and immunocompromised persons). With the advent of PNEU-C-20, current recommendations are to use this conjugate vaccine in place of PNEU-P-23 in adult populations as well.

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, PNEU-C-20 is preferred over PNEU-C-15, which is in turn preferred over PNEU-C-13.

Note that PNEU-C-20 is not currently authorized for use in pediatric populations, and PNEU-C-15 is only newly recommended in this population on a discretionary basis, as of March 2023. Thus, for children, the preferred conjugate preparation is PNEU-C-15 when available, with an understanding that PNEU-C-13 may be more practical for reasons of cost and availability.

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## A Note on Interchangeability

In general, PNEU-C vaccines may be used interchangeably in the interest of completing a course of immunization. For example, a series that was begun with PNEU-C-13 may be continued with PNEU-C-15, or vice versa.

Conjugate vaccines and polysaccharide vaccines ARE NOT interchangeable. Though the polysaccharide vaccine is effective against a broader range of serotypes, it has different immunogenic properties and is generally offered in addition to a series of conjugate vaccines, and not in place of such a series.

## Who should receive the pneumococcal vaccine?

### Healthy children (2 months to 5 years of age)

- Routine immunization with PNEU-C is recommended
- Provincial and territorial schedules may consist of either 3 or 4 doses, beginning at 2 months of age, with the final dose usually being given between 12 and 15 months of age
- [See Table 3 for schedule](#)

### Children at high risk of IPD (2 months to 17 years of age)

- Immunization with a 4-dose schedule (3+1) of PNEU-C is recommended for children with underlying medical conditions associated with a high risk of IPD
- Additional immunization with PNEU-P-23 is recommended at 24 months of age, while those at highest risk should receive an additional booster dose
- [See Table 4 for schedule](#)

### Adults at high risk of IPD (18+ years of age)

- Immunization with PNEU-C-20 (or PNEU-C-15/PNEU-P-23) is preferentially recommended for adults with immunocompromising conditions resulting in high risk of IPD, as well as for those aged 18-49 with underlying medical conditions
- In addition to underlying medical conditions, the following are also considered to place adults at high risk for IPD: houselessness, smoking, alcohol addiction, illicit drug use, residence in a long-term care facility
- [See Table 5 for schedule](#)

### Older adults (65+ years of age)

- Immunization with PNEU-C-20 is recommended for all adults aged 65 or older, including those previously immunized with PNEU-C-13 or PNEU-P-23 or both
- PNEU-C-15 followed by PNEU-P-23 may be administered instead of PNEU-C-20 when PNEU-C-20 is unavailable
- [See Table 5 for schedule](#)

**Table 2: Underlying Medical Conditions Resulting in High Risk of IPD  
(Highest Risk *Italicized*)**

Immunocompromising Conditions	Non-immunocompromising Conditions
<i>Sickle cell disease, asplenia, or splenic dysfunction</i>	Chronic cerebrospinal fluid (CSF) leak
<i>Congenital immunodeficiencies involving any part of the immune system</i>	Chronic neurologic condition that may impair clearance of oral secretions
<i>Immunocompromising therapy (corticosteroids, chemotherapy, radiation, post-transplant therapy)</i>	Cochlear implants, including children and adults who are to receive implants
<i>HIV infection</i>	Chronic heart disease
<i>Hematopoietic stem cell transplant (HSCT) (recipient)<sup>1</sup></i>	Diabetes mellitus
<i>Malignant neoplasms, including leukemia and lymphoma</i>	<i>Chronic kidney disease</i>
<i>Nephrotic syndrome</i>	<i>Chronic liver disease, including hepatic cirrhosis (any cause)</i>
<i>Solid organ or islet transplant (candidate or recipient)</i>	Chronic lung disease, including asthma requiring medical care in the preceding 12 months

<sup>1</sup>There is a special schedule for HSCT recipients. See page 7.

## Who should not receive the pneumococcal vaccine?

These vaccines have a well-established history of safety, but there are some contraindications and situations which warrant extra precautions.

- Individuals who have previously experienced an anaphylactic reaction to the vaccine—or who have a proven history of immediate or anaphylactic hypersensitivity to any vaccine component—should not be given the vaccine.
- Individuals with suspected hypersensitivity or non-anaphylactic allergy to the vaccine or any of its components should be investigated further in consultation with an allergist. Immunization in a controlled setting may be advised.
- Immunization should be postponed for individuals with moderate or severe acute illness. In the case of minor illness, with or without fever, immunization may proceed normally.

## 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.

### REMEMBER

In all cases, if vaccines are administered simultaneously, a separate injection site and a different syringe must be used for each.

## What about side effects and adverse reactions?

Severe adverse effects are rare following immunization and, in most cases, data does not suggest a causal relationship. Some mild to moderate reactions are more commonly seen.

- Soreness or redness may occur at the injection site.
- Occasional slight fever may occur.
- Fatigue may occur after vaccination with a conjugate pneumococcal vaccine.
- Headaches may occur after vaccination with a conjugate pneumococcal vaccine.
- Irritability and decreased appetite may occur in infants and children after vaccination with a conjugate vaccine.

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## What specific populations require special attention?

### Persons with inadequate immunization records

Children and adults with incomplete immunization records, or no immunization records, should be considered unimmunized and should receive pneumococcal vaccines on a schedule appropriate to their age and risk factors, regardless of possible previous immunization.

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### Infants born prematurely

Premature infants in stable clinical condition should be immunized with an authorized PNEU-C at the same chronological age and according to the same schedule as full-term infants. Hospitalized infants with birth weights under 1500g should receive continuous cardiac and respiratory monitoring for 48 hours after their first immunization.

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### Recipients of hematopoietic stem cell transplantation (HSCT)

HSCT recipients are at increased risk of IPD, and antibody response to pneumococcal vaccination is known to be poor in this population.

Regardless of age, pneumococcal vaccination should be started at 3 to 9 months post-transplant with 3 doses of authorized PNEU-C administered at least 4 weeks apart, followed by 1 dose of PNEU-P-23 administered 12 to 18 months post-transplant (at least 6 months after the last dose of PNEU-C). HSCT recipients over 2 years of age should receive an additional booster dose of PNEU-P-23 administered 1 year after the initial dose of PNEU-P-23.

## Immunization schedules

**Table 3: Recommended Routine Pneumococcal Immunization for Healthy Children Aged 2 Months to 17 Years**

At 2 months of age	1 dose of PNEU-C-15 or PNEU-C-13
At 4 months of age	1 dose of PNEU-C-15 or PNEU-C-13
At 6 months of age	0 or 1 dose of PNEU-C-15 or PNEU-C-13, depending on provincial or territorial schedule. When a 3-dose schedule is being followed, no dose is given at 6 months of age.
Between 12 and 15 months of age	1 booster dose of PNEU-C-15 or PNEU-C-13

**Table 4: Recommended Pneumococcal Immunization for Children Aged 2 Months to 17 Years at High Risk of IPD**

At 2 months of age	1 dose of PNEU-C-15 or PNEU-C-13
At 4 months of age	1 dose of PNEU-C-15 or PNEU-C-13
At 6 months of age	1 dose of PNEU-C-15 or PNEU-C-13
Between 12 and 15 months of age	1 booster dose of PNEU-C-15 or PNEU-C-13
At 24 months of age	1 dose of PNEU-P-23
At 7+ years of age	Children and adolescents at <i>highest risk</i> (see page 4) should receive 1 booster dose of PNEU-P-23, at least 5 years after any previous dose.

### Notes on Tables 3 and 4

- In all instances of pediatric immunization, PNEU-C-15 is the preferred vaccine when possible, and PNEU-C-13 is preferred when PNEU-C-15 is not available or practical. A series of vaccines that began with PNEU-C-13 may be continued with PNEU-C-15 and vice versa.
- Doses of PNEU-C should be administered at least 8 weeks apart.



## Immunization schedules

### Accelerated and Catch-up Schedules

For children less than 12 months of age who have received a partial or incomplete series of PNEU-C immunization, that series should be completed as usual to bring them up to the appropriate total number of doses. All doses should be administered at least 8 weeks apart.

For children ages 12 months to 5 years who have received a partial or incomplete series of PNEU-C immunization (or who have been immunized with a formulation protecting against 10 or fewer serotypes), one dose of PNEU-C-15 or PNEU-C-13 is recommended. A second dose (at least 8 weeks after the first) is recommended if the total previous vaccination consisted only of 0 or 1 dose at under 12 months of age.

**Table 5: Recommended Pneumococcal Vaccination for Adults at High Risk of IPD, Including Those Aged 65+**

<b>Adults aged 65+ who have not previously received a pneumococcal vaccine as an adult</b>	1 dose of PNEU-C-20 preferred (or 1 dose of PNEU-C-15 followed by 1 dose of PNEU-P-23 one year later)
<b>Adults aged 65+ who have previously received PNEU-C-13 or PNEU-P-23 or both, but have not received PNEU-C-20</b>	1 dose of PNEU-C-20 at least 5 years after any prior pneumococcal immunization
<b>Adults aged 50 to 64 who are at high risk for IPD</b>	1 dose of PNEU-C-20 preferred (or 1 dose of PNEU-C-15 followed by 1 dose of PNEU-P-23 one year later)
<b>Adults aged 18 to 49 who are at high risk of IPD due to an immunocompromising condition</b>	1 dose of PNEU-C-20 preferred (or 1 dose of PNEU-C-15 followed by 1 dose of PNEU-P-23 one year later)
<b>Adults aged 18 to 49 who are at high risk of IPD due to factors other than an immunocompromising condition</b>	1 dose of PNEU-C-20 or PNEU-C-15 at clinical discretion

### Notes on Table 5

- PNEU-C-20 is the preferred conjugate pneumococcal vaccine; however, it is not currently publicly funded in provincial and territorial immunization programs.
- If either PNEU-C-15 or PNEU-C-13 is used, one dose of PNEU-P-23 should be given at least 1 year later.
- For certain immunocompromised groups who have received PNEU-P-23, one lifetime booster dose of PNEU-P-23 is recommended at least 5 years after the original dose.
- Pregnant and breastfeeding persons can receive pneumococcal immunization without risk.