The role of pharmacists in providing recommended vaccines

Carlene Oleksyn, BSP, CDE, CTH

IN CANADA, THE NATIONAL ADVISORY COMMITTEE ON IMMUNIZATION (NACI) makes recommendations for vaccination.^{1,2} However, vaccines that are publicly funded vary by province and territory, largely based on cost effectiveness and budget capacity, rather than clinical indication and vaccine effectiveness. Using their full scope of practice, pharmacists have a unique opportunity to offer recommended protection against vaccine-preventable diseases to patients.

Pneumococcal vaccines

Disease burden

Streptococcus pneumoniae is a bacterium that causes invasive pneumococcal disease (IPD), such as bacteremia and meningitis, and is a common cause of community-acquired pneumonia (CAP). There are over 90 serotypes recognized worldwide, 15 of which cause the majority of disease. *S. pneumoniae* can spread from person to person by droplets from the nose or mouth, by sneezing or coughing.³

Available vaccines

Two approved vaccines are currently available in Canada for prevention of pneumococcal disease, as described in Table 1.⁴

PNEU-C-13 is indicated for infants and children from 6 weeks to 17 years of age for the prevention of IPD and adults 18 years of age and older for the prevention of pneumonia and IPD caused by serotypes contained in the vaccine.⁵ PNEU-P-23 is indicated for those aged 50 years or older and persons aged ≥ 2 years who are at increased risk for pneumococcal disease caused by serotypes contained in the vaccine.⁶

NACI recommends the use of PNEU-P-23 vaccine in routine vaccination programs for adults ≥ 65 years for the prevention of IPD. However, NACI also recommends on an individual basis—for immunocompetent adults ≥ 65 years not previously vaccinated against pneumococcal disease—the use of PNEU-C-13 vaccine followed by PNEU-P-23 (after at least 8 weeks) for

the prevention of CAP and IPD caused by the 13 pneumococcal serotypes included in the conjugate vaccine.⁷ The purpose of administering PNEU-P-23 to an individual who has already received PNEU-C-13 is to expand the breadth of serotypes against which an individual is protected.⁷

For immunocompetent adults ≥ 65 years, PNEU-P-23 is publicly funded in all jurisdictions,⁸ both at physician and public health clinics and, in some provinces, through pharmacies. PNEU-C-13 is not yet publicly funded, however, for immunocompetent older adults in any Canadian jurisdiction. Data are not publicly available regarding PNEU-C-13 uptake and/or vaccine impact on CAP in Canadian adults ≥ 65 years. However, real-world effectiveness of PNEU-C-13 against vaccine-type CAP in this population has been demonstrated in the United States.^{9,10}

Figure 1 specifies the timing of pneumococcal vaccination for PNEU-C-13 and/or PNEU-P-23.³

Practice tip: “My patients ≥ 65 years have previously received PNEU-P-23 through public funding. What is the current situation with NACI recommendations (and funding) for PNEU-C-13 in this population?”

While PNEU-C-13 is not yet funded for immunocompetent persons ≥ 65 years of age, NACI has given a permissive recommendation for the vaccine in this population, at the individual level.⁷ This is based on studies that have demonstrated efficacy of PNEU-C-13 against vaccine-type pneumococcal CAP, with no waning efficacy over 5 years, and no hyporesponsiveness.⁹⁻¹¹ In contrast, although studies have shown PNEU-P-23 is effective against invasive pneumococcal disease, its efficacy against noninvasive CAP is uncertain.⁷ Moreover, efficacy of PNEU-P-23 wanes after 5 years and hyporesponsiveness upon revaccination occurs.

TABLE 1 Pneumococcal vaccines

Vaccine type	Description	Trade name	Serotypes	Immune memory (IgG antibodies)	Hypo-responsiveness*	Reduces nasopharyngeal carriage
Pneumococcal conjugate (PNEU-C-13)	Polysaccharide antigens joined to a protein (conjugated)	Prevnar 13	1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F	Yes	No	Yes
Pneumococcal polysaccharide (PNEU-P-23)	Polysaccharide vaccine	Pneumovax 23	1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, 33F	No	Yes	No

*Reduced antibody response with subsequent boosters.

FIGURE 1 Timing of pneumococcal vaccination³

The National Advisory Committee on Immunization recommends administration of PNEU-C-13 at least 1 year after any previous dose of PNEU-P-23 vaccine due to the theoretical potential for decrease in antibody titres following vaccination with PNEU-P-23 vaccine.⁷

In this context, pharmacists have a key role to play in offering patients ≥ 65 years the additional protection provided by PNEU-C-13 vaccination. Even if the vaccine is not funded, a recommendation can still be made. It is also important to ensure that patients understand the sequence of dosing; if they proceed first with publicly funded PNEU-P-23, they cannot receive the benefits of PNEU-C-13 for another year (Figure 1).⁷

Herpes zoster vaccines

Disease burden

Primary varicella zoster virus (VZV) infection causes varicella (chickenpox), and reactivated infection results in herpes zoster (shingles). Herpes zoster (HZ) is characterized by neuropathic pain and dermatomal vesicular rash. HZ occurs most frequently among older adults and immunocompromised persons.

Postherpetic neuralgia (PHN), which can be debilitating, is the most frequent complication of HZ. The incidence of HZ,

hospitalization due to HZ and the risk of PHN among HZ cases increases significantly with age.¹²

Available vaccines

Two HZ vaccines are currently authorized for use in Canada in immunocompetent individuals ≥ 50 years of age—a recombinant subunit zoster vaccine, RZV (Shingrix), and a live attenuated zoster vaccine, LZV (Zostavax II). According to NACI recommendations, RZV should be offered to individuals ≥ 50 years of age, including those who have previously been vaccinated with LZV, based on its superior efficacy profile. LZV may be considered in immunocompetent individuals ≥ 50 years of age when RZV vaccine is contraindicated, unavailable or inaccessible.¹²

To date, only 1 Canadian province has implemented a publicly funded herpes zoster vaccination program.⁸ In Ontario, LZV is funded for adults 65 to 70 years vaccinated by physicians (the vaccine cost is not covered through pharmacies). As of early 2019, no jurisdiction has implemented publicly funded programs for RZV. Vaccine uptake (for both LHZ and RHZ) has been relatively limited for various reasons, and there is a scarcity of published data regarding the potential impact of these vaccines on the epidemiology of HZ in Canada.¹³

RZV is administered intramuscularly as a 2-dose schedule, 2 to 6 months apart. Alternatively, a 0, 12-month schedule may be considered based on evidence of an acceptable safety profile and robust anti-IgE immune response.¹⁴ LZV is administered subcutaneously as a single dose.¹²

Practice tips

“What is the effectiveness of each of the herpes zoster vaccines?” Significant waning of protection has been observed 1 year postvaccination with LZV, while RZV efficacy against incident HZ in the 4 years postvaccination remains consistent.¹²

“What if my patient is immunocompromised?” RZV (not LZV) may be considered for immunocompromised adults ≥ 50 years of age, based on a case-by-case assessment of the benefits versus risks.¹²

“Can I vaccinate my patient if they have had an active case of shingles?” Yes. RZV should be offered to individuals ≥ 50 years of age without contraindications who have had a previous episode of HZ. Vaccination with 2 doses of RZV may be considered at least 1 year after the HZ episode.¹²

“Should I encourage my patients who have already paid for and received the LZV to also be vaccinated with RZV?” Yes. NACI states that prior recipients of LZV vaccine will derive additional protection from completion of the 2-dose series of RZV (administered at least 1 year after LZV), given the higher and more durable vaccine efficacy of RZV.¹²

Human papillomavirus vaccines

Disease burden

Human papillomavirus (HPV) is the most common sexually transmitted infection. There are over 100 types of HPV, with high-risk types leading to cervical, anogenital and head and neck cancers and low risk types leading to anogenital warts.¹⁵ HPV 16 and 18 cause approximately 70% of cervical cancers, while types 31, 33, 45, 52 and 58 account for approximately 15% to 19% of cervical cancers. More than 90% of anogenital warts are caused by HPV types 6 and 11.¹⁵

Available vaccines

In Canada, there are currently 2 licensed vaccines for prevention of HPV. HPV2 (Cervarix) vaccine is indicated in females aged 9 to 45 years for the prevention of cancers caused by serotypes 16 and 18.¹⁶

HPV9 vaccine (Gardasil 9) is indicated in females 9 to 45 years of age for the prevention of cervical, vulvar and vaginal cancers; precancerous lesions and anogenital warts; associated cancers and pre-cancerous lesions caused by serotypes 6, 11, 16, 18, 31, 33, 45, 52 and 58.¹⁷

HPV9 vaccine is indicated in males age 9 to 26 years for the prevention of anal cancers, precancerous lesions and anogenital warts. While there are no data on the use of HPV9 vaccine in men 27 years of age and older, it may be administered to those who are at ongoing risk of exposure to HPV.¹⁵

Note: NACI still includes HPV4 in its recommendations. However, because HPV4 has not been widely used since the introduction of HPV9 in 2015, HPV4 will not be discussed in this article.¹⁵

In Canada, publicly funded school-based HPV programs have been in place for over a decade, beginning with girls. In all Canadian jurisdictions, such school-based programs currently offer HPV vaccination for both girls and boys (targeting 1 or more cohorts across grades 4-7, plus catch-up groups).¹⁸⁻²⁰

Coverage rates for public HPV vaccination programs vary across jurisdictions, with uptake ranging from 40% (Manitoba) to 90% (Newfoundland), as of June 2013.¹⁹ Since its introduction in Canada, the HPV vaccine has had significant impact in adolescents. In studies looking at HPV-related conditions pre- and postvaccine, there has been an 86% decline in the incidence risk ratio of precancerous cervical cells among females aged 15 to 17 years (British Columbia) and a 45% decline in genital warts incidence rates among females aged 15 to 19 years (Quebec).²¹

For females and males 9 to 14 years of age, either a 2- or 3-dose vaccination schedule with HPV2 or HPV9 vaccine is recommended. The 3-dose schedule should be maintained for HPV2 or HPV9 vaccines in immunocompromised populations, immunocompetent HIV-infected individuals and individuals who have not received any dose of HPV vaccine by 15 years of age.^{15,22}

Practice tip: “What if I don’t know what type of HPV vaccine my patient was started on?”

Whenever possible, 1 brand of vaccine should be used to complete a vaccine series. If the brand of previously received dose(s) is unknown, HPV9 vaccine may be used to complete the series.¹⁵

Practice tip: “Should I assume that all young adults have received the HPV vaccine through a publicly funded program?”

No, there is a large population of Canadians for whom HPV vaccination is recommended but who have not been offered the vaccine through a publicly funded program. Many young adults may have missed the school-based program due to their age, their parents opting out of the vaccine at the time or missed doses due to illness or absence from school. It is best practice to screen all eligible patients who may benefit from HPV vaccination.

Start the conversation

Pharmacists may hesitate to offer vaccines that are recommended but not publicly funded, due to cost considerations. However, it is important to remember that individual patients have their own perception of value, and pharmacists have a responsibility and ethical obligation to educate patients on all vaccinations available, ultimately letting each patient make the final decision.

Pharmacists have a responsibility to provide accurate information and address potential misconceptions (e.g., regarding pneumococcal vaccine recommendations and funding, HZ vaccine efficacy and/or HPV vaccination and sexual activity).¹⁹ This will ensure patients can make informed decisions regarding vaccination and help overcome potential barriers to vaccine uptake. In summary, pharmacists must advocate for vaccination to minimize infection and improve public health outcomes, taking patient values into account. ■

From *Mint Health + Drugs Meridian*, Stony Plain, Alberta. Contact carlene.oleksyn@shaw.ca.

ORCID iD: Carlene Oleksyn <https://orcid.org/0000-0003-1241-6292>

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