

VACCINES: Pneumococcal, Influenza, & Shingles

Immunization Guidelines and Saskatchewan Health Coverage Considerations

Vaccines prevent morbidity and mortality to various degrees. Many vaccines are publicly funded, especially if potentially life-saving. When guideline recommendations & public coverage differ, clinicians/patients must weigh the evidence for benefit versus the out-of-pocket patient cost. **Note:** vaccine costs listed in this document do not include markup, dispensing fees, or administration fees, which can vary depending on who is administering the vaccine.

1. Who may benefit from a PNEUMOCOCCAL vaccine in Saskatchewan?

Available vaccines include the **PNEUMOVAX** 23-valent vaccine (\$24) and the **PREVNAR** 13-valent vaccine (\$103).

Covered in Sask: ¹	Evidence for benefit	Guideline recommendations
<ul style="list-style-type: none"> 1 dose of PNEUMOVAX for anyone ≥65 years old. 1 dose of PNEUMOVAX for anyone with specific medical conditions (e.g. diabetes, COPD, others*). 2 doses of PNEUMOVAX spaced 5+ years apart for anyone with specific high risk medical conditions (e.g. HIV, transplants, others*). 	<ul style="list-style-type: none"> A single pneumococcal vaccination appears to reduce the risk of community-acquired pneumonia by 30% (NNT = 55) and the risk of a COPD exacerbation by 40% (NNT = 8).^{2,19,20} Benefits are consistent regardless of which vaccine formulation is used.²⁻⁴ No trials have yet assessed the efficacy of PREVNAR and PNEUMOVAX combined versus one vaccine alone. 	<ul style="list-style-type: none"> Immunization guidelines^{NACI} suggest that if PNEUMOVAX was given before the age of 65, a booster dose should be given 5 years later to all patients regardless of risk factors.¹⁸ This recommendation is based on the tendency for older adults to have a weakened immune system. Immunization guidelines suggest that the theoretical greater potency of PREVNAR over PNEUMOVAX may justify dual vaccination in certain individuals (but no guidance given as to which individuals).⁵

*Visit <http://publications.gov.sk.ca/documents/13/108111-Pneu-P-23%20April%202017.pdf> for a full list of individuals covered for **PNEUMOVAX** in SK.

Bottom line: Pneumococcal vaccination effectively reduces the risk of invasive pneumococcal disease. It's uncertain if one vaccine provides extra benefit over another.

2. Who may benefit from an INFLUENZA vaccine in Saskatchewan?

Available vaccines include trivalent (3-strain, \$9 covered in Sask), quadrivalent (4-strain, \$12 covered in Sask), a trivalent high-dose formulation (4 times more antigen than the usual trivalent vaccine, \$64), and others.

Covered in Sask: ¹	Evidence for benefit	Guideline recommendations
<ul style="list-style-type: none"> Annual quadrivalent vaccination to anyone ≥6 months old. High-dose trivalent vaccination (FLUZONE HIGH-DOSE) to anyone in long-term care ≥65 years old. 	<ul style="list-style-type: none"> In general, influenza vaccination is 10-60% effective depending on yearly match.^{6,7} In adults ≥65 years old, influenza vaccination reduces the risk of influenza from 6% to 2.4% (NNT = 28).⁸ Compared to standard dosing, high-dose influenza vaccination prevents more influenza cases in adults ≥65 years old, but the absolute benefit is small (NNT = 200).⁹ For adults in long-term care ≥65 years old, high-dose influenza vaccination prevents hospitalizations (NNT = 81).¹⁰ 	<p>Immunization guidelines^{NACI} suggest that the statistically significant benefit for the high dose influenza vaccination (NNT = 200) warrants administration to <u>all</u> adults ≥65 years old.¹¹</p>

Bottom line: Influenza vaccination effectively reduces influenza risk, regardless of formulation. Using the high-dose influenza vaccine for adults in long-term care ≥ 65 years old can additionally reduce hospitalizations.

3. Who may benefit from a SHINGLES vaccine in Saskatchewan?

Two shingles vaccines are available: a 2-dose recombinant vaccine (**SHINGRIX**, \$132 per dose) and a live vaccine (**ZOSTAVAX**, \$187). Shingles vaccination is guideline recommended, with high-quality evidence to support, but is **not currently covered publicly in Saskatchewan**. Some drug plans offer private coverage.

SHINGRIX or ZOSTAVAX?	What if the patient already received ZOSTAVAX?	What if the patient previously had shingles?
<p>SHINGRIX is vaccine of choice. The baseline risk of shingles in adults ≥65 years old is approximately 1% per year.¹⁷ SHINGRIX will reduce this risk by 91%;¹² ZOSTAVAX only by 50%.¹³ Typically the SHINGRIX vaccination series is offered starting when patients turn 50.</p>	<p>Immunization guidelines suggest vaccinating again, this time using SHINGRIX. American guidelines suggest waiting 2 months before re-vaccination;¹⁴ Canadian guidelines suggest waiting 1 year (since ZOSTAVAX is most effective in the first year).¹⁵</p>	<p>Since shingles may occur again, immunization guidelines suggest vaccinating with SHINGRIX one year after the shingles episode.¹⁵ This recommendation is based on expert opinion.</p>

See also: RxFiles Q&A's on Shingrix & Zostavax, available online at www.rxfiles.ca, for further comparison of **ZOSTAVAX** and **SHINGRIX**.

Bottom line: Shingles vaccines are efficacious, and indicated in older adults, but not covered publicly.

References:

1. Saskatchewan Immunization Services. Accessed from <https://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services> on May 31, 2019.
2. Walters JA, Tang JN, Poole P, Wood-Baker R. Pneumococcal vaccines for preventing pneumonia in chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2017 Jan 24;1:CD001390.
3. Jackson LA, Gurtman A, van Cleeff M, Jansen KU, Jayawardene D, Devlin C, Scott DA, Emini EA, Gruber WC, Schmoele-Thoma B. Immunogenicity and safety of a 13-valent pneumococcal conjugate vaccine compared to a 23-valent pneumococcal polysaccharide vaccine in pneumococcal vaccine-naïve adults. *Vaccine.* 2013 Aug 2;31(35):3577-84.
4. Van Buynder P, Booy R. Pneumococcal vaccination in older persons: where are we today? *Pneumonia (Nathan).* 2018 Jan 5;10:1.
5. NACI immunization recommendations update: Pneumococcal Vaccines. Accessed from <https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2016-42/ccdr-volume-42-12-december-1-2016/ccdr-volume-42-12-december-1-2016-improving-vaccination-rates-4.html> on May 31, 2019.
6. CDC: Key Facts about Flu Vaccines. Accessed from <https://www.cdc.gov/flu/protect/keyfacts.htm> on May 31, 2019.
7. CDC: Vaccine Effectiveness Studies. Accessed from <https://www.cdc.gov/flu/professionals/vaccination/effectiveness-studies.htm> on May 31, 2019.
8. Demicheli V, Jefferson T, Di Pietrantonj C, et al. Vaccines for preventing influenza in the elderly. *Cochrane Database Syst Rev.* 2018 Feb 1;2:CD004876.
9. DiazGranados CA, Dunning AJ, Kimmel M, et al. Efficacy of high-dose versus standard-dose influenza vaccine in older adults. *N Engl J Med.* 2014 Aug 14;371(7):635-45.
10. Gravenstein S, Taljaard M, Gozalo P, et al. Relative effect of high-dose influenza vaccination on hospitalizations of older adults in United States nursing homes: results from a cluster-randomized controlled trial. *Open Forum Infect Dis.* 2015;2(Suppl 1):S67. inf ref 5
11. NACI Summary Influenza 2018–2019. Accessed from <https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2018-44/issue-6-june-7-2018/article-1-summary-influenza-2018-2019.html> on May 31, 2019
12. Cunningham AL, Lal H, Kovac M, Chlibek R, Hwang SJ, Díez-Domingo J, Godeaux O, Levin MJ, McElhaney JE, Puig-Barberà J, Vanden Abeele C, Vesikari T, Watanabe D, Zahaf T, Ahonen A, Athan E, Barba-Gomez JF, Campora L, de Looze F, Downey HJ, Ghesquiere W, Gorfinkel I, Korhonen T, Leung E, McNeil SA, Oostvogels L, Rombo L, Smetana J, Weckx L, Yeo W, Heineman TC; ZOE-70 Study Group. Efficacy of the Herpes Zoster Subunit Vaccine in Adults 70 Years of Age or Older. *N Engl J Med.* 2016 Sep 15;375(11):1019-32.
13. Oxman MN et al. Shingles Prevention Study Group. A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *N Engl J Med.* 2005 Jun 2;352(22):2271-84
14. Dooling KL, Guo A, Patel M, et al. Recommendations of the Advisory Committee on Immunization Practices for Use of Herpes Zoster Vaccines. *MMWR Morb Mortal Wkly Rep* 2018;67:103–108.
15. Warrington R, Ismail S. Summary of the NACI Update on Herpes Zoster Vaccines. *Can Commun Dis Rep* 2018;44(9):220-5. <https://doi.org/10.14745/ccdr.v44i09a06>
16. T.F. Schwarz, S. Volpe, G. Catteau, R. Chlibek, M.P. David, J.H. Richardus, et al. Persistence of immune response to an adjuvanted varicella-zoster virus subunit vaccine for up to year nine in older adults. *Hum Vaccines Immunotherapeutics* (2018), pp. 1-8
17. Donahue JG, Choo PW, Manson JE, et al. The incidence of herpes zoster, *Arch Intern Med*, 1995, vol. 155 (pg. 1605-9)
18. NACI Page 16: Canadian Immunization Guide: Part 4 - Active Vaccines. Accessed from <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-16-pneumococcal-vaccine.html#a3> on May 31, 2019.
19. Moberley S, Holden J, Tatham DP, Andrews RM. Vaccines for preventing pneumococcal infection in adults. *Cochrane Database Syst Rev.* 2013 Jan 31;1:CD000422.
20. Tools for Practice. Pneumonia Vaccine for Adults: Is the efficacy as effective as the effort? Accessed from https://www.acfp.ca/wp-content/uploads/tools-for-practice/1532717807_tfp217pneumovaxfv.pdf on May 31, 2019.