

SASKPIC Conference

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Healthcare Worker and Adult Immunization Recommendations

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Objectives

1. To review recommended immunizations for healthcare workers (HCWs) and adults including long-term care (LTC) residents.
2. To promote provincial and national immunization resources.
3. To address your immunization questions.

Immunization Resources

1. Saskatchewan Immunization Manual (SIM):
<https://www.ehealthsask.ca/services/manuals/Pages/SIM.aspx>
2. SK Immunization fact sheets:
<https://www.saskatchewan.ca/residents/health/accessing-health-care-services/immunization-services>
3. Canadian Immunization Guide (CIG):
<https://www.canada.ca/en/public-health/services/canadian-immunization-guide.html>
4. Immunize Canada: <https://immunize.ca/>
5. Vaccine product monographs

Why is HCW immunization important?

1. They are at risk of exposure to diseases because of their contact with patients/clients, colleagues, family and their environment.
2. There is a risk that they can transmit undiagnosed or asymptomatic diseases to others.

Ref: The *Canadian Immunization Guide*: <https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-3-vaccination-specific-populations/page-11-immunization-workers.html#p3c10a2>
saskatchewan.ca

HCW definitions

SIM chapter 7 section 6.0 - HCW definitions:

- A clinical and/or non-clinical individual employed by the Athabasca Health Authority, Saskatoon Health Authority, Saskatchewan Cancer Agency, a Community Clinic or a First Nations Jurisdiction (AHA/SHA/SCA/CC/FNJ) and their respective affiliates, and includes individuals who have been appointed as practitioner staff (e.g., midwives).
- This includes special care and long-term care facility affiliates as well.

Recommended immunizations: HCW

SIM chapter 7 section 6.0 - HCW definitions:

- Eligible to receive tetanus, diphtheria, pertussis, hepatitis B, polio, measles, mumps, rubella, varicella, and influenza vaccines.

6.3 → Publicly-Funded Vaccines-Health-Care-Worker—Eligible-for-Publicly-Funded-Vaccines-¶
Refer-to-Chapter-10,-Biological-Products-for-specific-vaccine-information.-¶

Vaccine¶	Immunity-Criteria¶	Recommendations-¶
Td/Tdap¶	<ul style="list-style-type: none"> • → Documentation-of-a-3-4-dose-primary-series,-with-last-dose-given-<10-years-ago.¶ 	<ul style="list-style-type: none"> • → Td-vaccine-recommended-every-10-years-after-primary-series.¶ • → Adults-are-eligible-for-one-Tdap-dose-to-replace-a-Td-dose.-For-example,-a-nursing-student-who-received-Tdap-at-age-14-is-eligible-to-receive-Tdap-at-age-24-years-and-is-not-recommended-to-receive-it-sooner-regardless-of-employer-or-educational-institution.¶
IPV¶	<ul style="list-style-type: none"> • → Documentation-of-a-3-dose-primary-series-given-by-any-route-with-at-least-one-dose-received-at-4-years-of-age-or-older.¶ 	<ul style="list-style-type: none"> • → Reinforcement-(booster)-doses-are-not-publicly-funded-or-recommended-after-a-primary-series-for-HCWs.¶
HB¶	<ul style="list-style-type: none"> • → Documentation-of-an-age-appropriate-2-or-3-dose-HB-series-and-adequate-serologic-antibodies-at-least-4-weeks-post-immunization;-or¶ • → Serological-evidence-of-previous-HB-infection-(anti-HBs+&-anti-HBc+;-or-HBsAg+&-Anti-HBc-IgM).¶ 	<ul style="list-style-type: none"> • → If-titres-are-<10-IU/L-any-time-after-the-completion-of-a-primary-HB-series,-refer-to-Chapter-7-Section-6.0-Occupation-for-recommendations.¶ • → Non-responders-that-have-completed-two-HB-immunization-series-are-unlikely-to-benefit-from-further-HB-immunization-and-are-considered-indefinitely-susceptible-to-HB-virus.-They-must-receive-two-doses-of-HBIg-one-month-apart-if-exposed.-¶
Influenza¶	<ul style="list-style-type: none"> • → None.¶ 	<ul style="list-style-type: none"> • → Annual-immunization.¶
Varicella¶	<ul style="list-style-type: none"> • → Documentation-of-two-doses-of-a-varicella-containing-vaccine;-or¶ • → Serological-evidence-of-VZV-IgG-antibodies.¶ 	<ul style="list-style-type: none"> • → Contraindicated-during-pregnancy.-Counsel-women-to-avoid-pregnancy-for-1-month-post-immunization.¶
Measles¶	<ul style="list-style-type: none"> • → Documentation-of-two-doses-of-a-measles-containing-vaccine;-or¶ • → Serological-evidence-of-measles-IgG-antibodies.¶ 	<ul style="list-style-type: none"> • → MMR-vaccine-is-publicly-funded-for-HCWs.-Refer-to-Chapter-5,-Appendix-5.2:-Publicly-Funded-MMR-Vaccine-Eligibility-to-assess-MMR-dose-eligibility.¶ • → Contraindicated-during-pregnancy.-Counsel-women-to-avoid-pregnancy-for-1-month-post-immunization¶
Mumps¶	<ul style="list-style-type: none"> • → Documentation-of-two-doses-of-a-mumps-containing-vaccine;-or¶ • → Serological-evidence-of-mumps-IgG-antibodies.¶ 	<ul style="list-style-type: none"> • → MMR-vaccine-is-publicly-funded-for-HCWs.-Refer-to-Chapter-5,-Appendix-5.2:-Publicly-Funded-MMR-Vaccine-Eligibility-to-assess-MMR-dose-eligibility.¶ • → Contraindicated-during-pregnancy.-Counsel-women-to-avoid-pregnancy-for-1-month-post-immunization.¶
Rubella¶	<ul style="list-style-type: none"> • → Documentation-of-one-dose-of-a-rubella-containing-vaccine-(NOTE:-Although-a-second-dose-of-rubella-is-not-considered-necessary-for-immunity,-it-is-not-harmful-and-may-benefit-the-1%-to-5%-of-people-who-do-not-respond-to-primary-immunization-(CIG));-or¶ • → Serological-evidence-of-rubella-IgG-antibodies.¶ 	<ul style="list-style-type: none"> • → MMR-vaccine-is-publicly-funded-for-HCWs.-Refer-to-Chapter-5,-Appendix-5.2:-Publicly-Funded-MMR-Vaccine-Eligibility-to-assess-MMR-dose-eligibility.¶ • → Contraindicated-during-pregnancy.-Counsel-women-to-avoid-pregnancy-for-1-month-post-immunization.¶

Recommended immunizations: HCW

SIM chapter 7 section 6.0 - HCW definitions:

- A HCW who is not employed by the AHA/SHA/SCA/CC/FNJ and their respective affiliates is only eligible for routine publicly funded adult vaccines as noted in Chapter 5, *Immunization Schedules*.

	Inf	Tdap*	IPV* 1	Td	MMR 2, 3	Var 3, 4, 5	Men- C-C ⁶	Men-C- ACYW- 135 ⁷	HB 8	HPV- 9 ⁹	Pneu- P-23 ¹⁰	HA 11
First visit	•	•	•		•	•	•	•	•	•	•	•
1 month after 1 st visit			•	•	•	•			•	•		
6 months after 1 st visit									•	•		•
6 months after 2 nd visit			•	•								

Recommended immunizations: HCW

SIM chapter 7 section 6.0 - HCW definitions:

- Post-secondary HCW students have the potential for the above listed exposures and disease transmission.
- They are considered HCWs and are eligible to receive the same vaccines as HCWs.

Influenza

- Influenza is a respiratory infection caused primarily by influenza A and B viruses.
- In Canada, influenza generally occurs each year in the late fall and winter months.
- Influenza occurs globally with an annual attack rate estimated at 5–10% in adults and 20–30% in children.
- Antigenic viral drifts every year, hence need to reimmunize yearly.

Influenza

- Influenza vaccine is safe and well-tolerated.
- Influenza vaccine cannot cause influenza illness because:
 - Inactivated influenza vaccines do not contain live viruses.
 - Live attenuated influenza vaccines contain weakened viruses.

2019-20 Influenza Immunization Campaign

- Start date is October 21, 2019.
- (Inactivated) quadrivalent doses (QIV) (contains 4 viral strains) for the general public 6 months and older who do not have contraindications.
 - Fluzone[®] Quadrivalent
 - FluLaval[®] Tetra
- Egg allergy is not a contraindication.

2019-20 Influenza campaign

- (Inactivated) Fluzone[®] High Dose trivalent vaccine (TIV HD) (contains 3 viral strains) for LTC residents 65 years and older (for a second year).
 - High dose flu vaccine contains 4 times the amount of antigens than QIV vaccine.
 - Seniors mount a higher antibody response with high dose flu vaccine.
 - Expensive hence specific targeted population.

2018-19 Influenza season

- H1N1 started circulating in early October and peaked in December. H3N2 circulated later in the season.
- Immunization of LTC facility staff and residents was permitted prior to the October 22, 2018 start date as a result of early H1N1 circulation and on-time arrival of vaccine.
- There were:
 - 44 influenza outbreaks in LTC facilities;
 - 69 hospitalizations for severe illness;
 - 13 deaths (including 4 children); and
 - 2,566 confirmed influenza samples collected.

Influenza vaccine

- The overall provincial coverage rate was **30%** compared with 26% in the 2017-18 season.
- Final coverage rates :
 - 85% for seniors (150,033 of 179,569 seniors)
 - 92% for LTC residents (7,808 of 8,469 LTC residents)
 - **53%** for HCWs (**23,023** of 43,831 HCWs)

2018-19	2017-18	2016-17
53%	52%	55%

Influenza vaccine

- Why is annual HCW uptake of flu vaccine around 50%?
 - Vaccine hesitancy
 - Concerns about side effects
 - Believe it can cause influenza or a cold
 - Personal autonomy vs greater good
 - Do not understand herd immunity disease risk and transferability to vulnerable groups
 - Rely on antivirals or ‘alternative’ prevention and/or treatments

Influenza vaccine

- How can influenza immunization be promoted to HCWs?
 - Education about herd immunity and disease risk of vulnerable populations and colleagues in work setting
 - Track provincial flu activity
 - Immunization fact sheet to all employees
 - Peer immunizers/role modelling

Pertussis-containing vaccines

- Pertussis (whooping cough) is a highly communicable bacterial illness.
- Its severity is greatest among infants who are too young to be protected by a complete vaccine series.
- Pertussis immunization in pregnancy is estimated to protect approximately 90% of infants less than 3 months of age

Pertussis-containing vaccines

- Tetanus-diphtheria (Td) vaccine recommended every 10 years after primary series.
- HCWs are eligible for one publicly funded tetanus-diphtheria-pertussis (Tdap) dose to replace one Td dose (unless pregnant).
- Redness, swelling and pain at the injection site are the most common adverse reactions to acellular pertussis-containing vaccines.

Pertussis-containing vaccine for HCWs

- No national recommendations to immunize HCW students or HCWs earlier, or to receive Tdap booster in their career as no benefit to patients or self.
- No sustained immunogenicity to pertussis.
- Purchase by employee or employer if needed earlier than 10 years.
- Private purchased vaccines are not reimbursable by Ministry.

Pertussis-containing vaccines

- E.g., a nursing student who received Tdap at age 14 is only eligible to receive publicly funded Tdap at age 24 years (10 yrs later) and is ineligible to receive it sooner regardless of employer or educational institution requests (e.g., NICU rotation).

Pertussis-containing vaccine for adults

- Adults are eligible for one publicly funded Tdap dose to replace a routine Td dose (boosters every 10 years).
- **Infant pertussis prevention** is focused on immunizing women in every pregnancy (ideally between 27-32 weeks gestation) for passive antibody protection of the infant until they are old enough to be immunized (2 months old).
- **Infant pertussis cocooning**: Adult caregivers of infants <6 months old who have not received a dose of Tdap as an adult.

Pneumococcal disease

- 1 in 4 cases becomes invasive pneumococcal disease (IPD) in general population.
- Bacterial pneumonia, bacteremia and meningitis.
- Seniors tend to have co-morbidities that increase their susceptibility to IPD, especially to community acquired pneumonia (CAP).
- Hospitalization rate 1,537/100,000 for seniors because of CAP.

Pneumococcal vaccines for adults

- Polysaccharide vaccine: Pneumovax[®] (Pneu-P-23)

INDICATIONS	<ul style="list-style-type: none">• All persons ≥ 65 years of age.• All residents of Extended or Intermediate Care Facilities.• All persons ≥ 2 years of age with:<ul style="list-style-type: none">○ alcoholism○ asplenia – congenital, acquired or functional ¹○ renal disease○ liver disease including cirrhosis, hepatitis B, hepatitis C○ CSF disorders○ cardiac or lung disease (except asthma, unless management involves high dose oral corticosteroid therapy)○ cochlear implant recipient or candidate○ congenital immunodeficiency or acquired complement deficiency○ cystic fibrosis○ diabetes mellitus○ immunosuppressive medical treatment ² (e.g., lymphoma, Hodgkin's, multiple myeloma, high dose steroids, chemotherapy radiation therapy, post-solid organ transplant therapy)○ HIV ²○ malignancies/cancer (individual must currently have) ²○ neurological conditions that impeded the clearance of oral/respiratory secretions○ sickle cell disease and other hemoglobinopathies○ solid organ or islet transplant recipient or candidate○ hematopoietic stem cell transplant (HSCT) recipient○ residents of group homes, LTC facilities○ homelessness and/or illicit drug use
DOSE / SERIES ^{3,4}	<ul style="list-style-type: none">• Adults and children 2 years and older: 0.5 mL SC or IM.

Pneumococcal vaccines for adults

- Polysaccharide vaccine: Pneumovax[®] (Pneu-P-23)

REINFORCEMENT	A one-time reinforcement dose should be offered 5 years later to those who have:
Reinforcement doses are not provided to healthy individuals.	<ul style="list-style-type: none">• asplenia – congenital, acquired or functional• sickle cell disease and other hemoglobinopathies• immunosuppressive medical treatment• congenital immunodeficiency• acquired complement deficiency• renal disease• liver disease including cirrhosis, hepatitis B, hepatitis C• HIV• malignancies/cancer⁴• hematopoietic stem cell transplant (HSCT) recipient (as per agency guidelines)

- Common side effect is cellulitis (severe pain, swelling, induration, edema), especially if vaccine repeated.
- Blunting of immunity with frequent doses.

Pneumococcal vaccines for adults

- Conjugate vaccines: Prevnar 13 (Pneu-C-13)
 - Pneu-C-13 is publicly funded for adult stem cell recipients (4 doses) and adults with HIV (1 dose)
 - It is licensed for adults 18 years and older and is available by prescription for those ineligible for publicly funded vaccine.
 - Costs related to privately purchased vaccines are not reimbursable by the Ministry of Health.
 - Spacing intervals required between different pneumococcal vaccines

Hepatitis B

- Adults born since Jan. 1, 1984 eligible.
- Many HCW may have received HB series in school.
- Publicly funded for many lifestyle and medical risk factors.

- Those born since January 1, 1984.
- Grade 6 students.
- Children of immigrants to Canada from regions of intermediate or high HB prevalence.
 - This includes all children born before the family's arrival in Canada **and** all children born after the family's arrival in Canada.
 - Go to map at: <http://wwwnc.cdc.gov/travel/yellowbook/2016/infectious-diseases-related-to-travel/hepatitis-b#4621>
- RHA/SCA/FNJ Healthcare workers and healthcare students (refer to SIM chapter 7 for definition).
- Those who started a publicly funded series in another jurisdiction.
- Non-immune individuals with bleeding disorders and others who receive repeated infusions of blood or blood products or plasma-derived replacement clotting factors.
- Individuals with congenital immunodeficiencies. ³
- Individuals who are HIV positive who are non-immune to HB³.
- Individuals who have liver disease (e.g., alcoholism, hepatitis C, cirrhosis) who are non-immune to HB.
- Individuals with renal disease (predialysis, hemodialysis & peritoneal dialysis) who are non-immune to HB ³.
- Liver or kidney transplant candidates or recipients who are non-immune to HB ².
- Haematopoietic stem cell transplant (HSCT) recipients ².
- Household/sexual/close contacts of individuals who have an acute or chronic HB infection ⁶.
 - Includes children in a child care setting in which there is an HB infected individual.
- Males and females with multiple sexual partners.
- Men who have sex with men
- Individuals that use or share illicit drug snorting, smoking or injection equipment.
- Sexual partners and household contacts of individuals who use illicit drugs.
- Group home residents
- Provincial correctional facility residents.
- Infant born to a HBsAg+ mother or high-risk mother whose HB status at delivery is unknown and STAT test results cannot be obtained within 12 hours after delivery ^{5,7}.
- Percutaneous (e.g., needle stick, bite) or mucosal exposure (e.g., sexual assault) ^{4,6,7}.

HB vaccine recommended for but not provided free: ⁸

- Travellers to countries with endemic hepatitis B.
- Non-healthcare workers who have an occupational risk of exposure.

Hepatitis B

- Initial infection with HB may be asymptomatic in up to 50% of adults and 90% of children.
- Infants, young children and immunocompromised persons are at highest risk of becoming chronic HB carriers.
- HB vaccine is 95% to 100% effective pre-exposure.
- Reactions to HB vaccine are generally mild and transient and include: irritability, headache, fatigue, as well as pain and redness at the injection site.

Hepatitis B

- It is estimated that less than 5% of Canadian residents have markers of past infection, and less than 0.5% are carriers.
- The incidence of HB has decreased in all age groups, coinciding with the increasing use of vaccine and has virtually disappeared in the cohorts [and targeted populations] that have benefited from routine immunization programs in Canada

Hepatitis B

Immunity criteria:

1. Documentation of an age-appropriate 2 or 3 dose HB series and adequate serologic antibodies at least 4 weeks post immunization;
or
 2. Serological evidence of previous HB infection (anti-HBs+ & anti-HBc+; or HBsAg+ & Anti HBc IgM).
- Boosters not recommended (but not harmful); good anamnestic response by memory cells upon exposure.

Hepatitis B

- If titres are < 10 IU/L any time after the completion of a primary HB series, refer to SIM chapter 7 *Hepatitis B Re-vaccination Assessment Algorithm*.
- Non-responders that have completed two HB immunization series are unlikely to benefit from further HB immunization and are considered indefinitely susceptible to hepatitis B virus. They must receive two doses of hepatitis immune globulin one month apart if exposed.

Measles, mumps, rubella

- Measles occurs worldwide and is one of the most highly communicable diseases. Canada has imported cases and occasional outbreaks of measles.
- Outbreaks of mumps continue to occur in Canada; the proportion of cases aged 20 years and older has increased.
- Up to 50% of rubella infections are subclinical; if a woman develops rubella during pregnancy, it can result in Congenital Rubella Syndrome (CRS) in the infant.

Measles, mumps, rubella

- SIM chapter 5 Appendix 5.2: Publicly Funded MMR Vaccine Eligibility (applies to everyone ≥ 1 year old)
- Adults born before 1970 considered immune to measles and mumps
- All adults born since 1970 qualify for a 2-dose series.
- 4 week interval required between TB skin test and live vaccine

Measles, mumps, rubella

- All HCWs are eligible for 2 measles, 2 mumps and 1 rubella publicly funded doses (usually 2 rubella given as combined vaccine) given 4 weeks apart if non-immune.
- Reactions to (live) MMR vaccine are generally mild and transient and include pain and redness at the injection site, fever less than 39°C, and rash.

Varicella zoster (chickenpox)

- Primary varicella zoster virus infection causes varicella zoster (chickenpox) and reactivated infection results in herpes zoster (shingles).
- Complications are more common in adolescents, adults and immunocompromised individuals.
- Individuals with impaired immunity are at risk of severe varicella and death.

Varicella zoster (chickenpox)

- Reactions to (live) varicella vaccine include: pain, swelling and redness at the injection site in 10% to 20% of vaccine recipients; low grade fever in 10% to 15%; and a varicella-like rash in 3% to 5% of vaccine recipients after the first dose and 1% after the second dose.
- HCWs eligible to receive 2 doses of publicly funded Varicella vaccine given 4 weeks apart if non-immune.

Herpes zoster (shingles)

- Herpes zoster (HZ) occurs most frequently among older adults and immunocompromised persons.
- Post-herpetic neuralgia (PHN) can be debilitating, and is the most frequent complication of HZ.
- Nearly 1 in 3 Canadians develops HZ in their lifetime. The incidence and severity of both HZ and PHN increases sharply after 50 years of age.
- Treatment options for HZ and PHN have limited effectiveness.

Herpes zoster (shingles)

- Vaccines reduce the incidence of HZ and PHN
- Shingrix: 2 dose non-live shingles vaccine
 - Not publicly funded in any Canadian jurisdiction.
 - Costly but effectiveness is very good.
 - For adults ≥ 50 years of age without contraindications who have previously been immunized with Zostavax, immunization with a 2 dose series of Shingrix should be considered after one year.
 - For adults ≥ 50 years of age without contraindications who have had a previous episode of HZ, immunization with a 2 dose series of Shingrix may be considered at least one year after the episode of HZ.
 - Persons with active HZ should not be immunized with HZ vaccine.

Herpes zoster (shingles)

- Zostavax II: 1 dose live shingles vaccine
 - Publicly funded only in Ontario.
 - Costly and effectiveness is not long lasting.
 - While protection against HZ remains statistically significant up to 3 years following immunization with Zostavax, significant waning of protection has been observed one-year post immunization, particularly in older age groups.

Summary

- Immunization is one of the most important and cost-effective public health innovations.
- At any age, vaccination provides the longest-lasting, most effective protection against disease.
- Immunization doesn't just protect the people who get immunized – it protects those around them too.

Questions

- Suggest contacting local Public Health as a key resource if you have questions.
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saskatchewan.ca