Standard For Recommended Immunization Schedules

Section 3:	Immunization General Principles		**Standard #: 03.110**
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Preamble

Alberta Health Services (AHS) Provincial Immunization Program Standards and Quality, Population and Public Health Division provides Public Health and other partners who administer provincially funded vaccines with ongoing and timely information relating to province-wide immunization program standards and quality. These standards are based on currently available evidence-based information, Alberta Health (AH) policy, and provincial and national guidelines. Immunizers must be knowledgeable about the specific vaccines they administer.

Immunization Standard for Immunization Schedules

General Scheduling Information:

Immunization schedules are designed to achieve the best levels of immunity and to increase client compliance. The timing should be adhered to as closely as possible but should not be considered rigid. The **minimum interval for the specific vaccine and the specific dose must be respected**. Routine schedules outlining optimal spacing should be followed as best practice whenever possible. When changes to the routine schedule are necessary, the immunizing nurse should record the rationale for the departure from the schedule. In certain circumstances, such as travel for an extended period of time, or when a person is off schedule and needs to be brought up to date as quickly as possible, the minimum interval may be used. See Section 5: *Minimum Intervals Between Vaccine Doses*.

If a vaccine schedule becomes interrupted, it should not be restarted, regardless of time lapse since the previous dose. In most circumstances, intervals between doses can be extended without compromising the immune response, remembering that optimal protection may not be achieved until the series is completed. This delay in achieving optimal protection may have significant consequences when administering post exposure prophylaxis vaccines such as rabies vaccine.

The vaccine/biological pages contain information for specific timing or scheduling recommendations. It is the immunizing nurse's professional responsibility to ensure the vaccines/biologicals being provided are indicated and necessary. All immunization encounters provide an opportunity to review the child's/client's immunization history and ensure all age-appropriate vaccines have been offered.

When assessing historical immunization records, vaccine doses are considered valid provided the minimum intervals for the specific vaccine and the specific doses are respected.

Special Considerations:

Premature infants should be immunized at the same chronological age as full term infants using the routine childhood immunization schedule. Due to lower levels of circulating maternal antibodies and a shorter duration of maternal protection, premature infants may be at greater risk of some vaccine-preventable diseases. In addition, commencement of a vaccine series is not dependent on the weight of an infant. However, for some vaccines, weight can affect the number of doses of vaccine required (e.g., hepatitis B vaccine).

Immunization records from out of country or out of province should be reviewed and assessed based on Alberta guidelines, and additional doses offered if indicated.

Immune Globulin and other blood products can interfere with the immune response to live vaccines. See Section 7: *Guidelines for Interval between Immune Globulin and other Blood Products and Live Vaccines* for recommended spacing.

Clients concerned about donating blood following receipt of vaccines should be referred to the Canadian Blood Services web site *www.blood.ca* or to call 1-888-236-6283 for the most up to date information.

Disease does not always confer immunity. Refer to vaccine specific biological pages to determine need to continue with immunization and the minimum interval between disease and vaccine if applicable.

Applicability

This standard applies to all Alberta Health Services staff providing provincially funded vaccines.

Competency

In November 2008 the Public Health Agency of Canada published the Immunization Competencies for Health Professionals with a goal of promoting safe and competent practices for immunization providers. The following competencies outlined in that document are applicable to this standard:

- Communication – Communicates effectively about immunization, as relevant to the practice setting(s).
- Populations Requiring Special Considerations – Recognizes and responds to the unique immunization needs of certain population groups.

Definitions

Routine schedule

- The routine schedule in Alberta is determined by Alberta Health and distributed to Alberta Health Services as Alberta Immunization Policy. Administration of vaccines according to the routine schedule will provide optimal protection from vaccine-preventable diseases. The routine immunization schedule in Alberta has been determined to provide best protection to individuals considering a number of factors (e.g., epidemiology of disease, vaccine effectiveness, ability of an individual to respond to the specific vaccine).
- When booking a child for **routine childhood immunization** the schedule is based on the child's age in calendar months. For example, when booking a child for their 2 month immunization appointment the child should be 2 calendar months of age.
- When determining the schedule for children who are delayed (fall behind the routine schedule by one month or more) for immunizations or when reviewing historical immunization records, the following definitions for intervals may be used.
  - **1 month:** Equal to 4 weeks or 28 days.
  - **2 months:** Equal to 8 weeks or 56 days.
  - **Calendar month:** Used for calculating intervals greater than 2 months. Exceptions to this may occur where intervals are calculated using weeks or days.

Simultaneous/concurrent administration means the same clinic day. If a client receives a vaccine in the morning and then another that same afternoon, it would be considered simultaneous administration.

- Vaccines used for routine immunization may be given simultaneously using different needles, syringes and injection sites.
  - There is no evidence that simultaneous administration of most vaccines either reduces vaccine effectiveness or increases the risk of adverse events.
  - Simultaneous administration increases the probability that the individual will be immunized fully by the appropriate age. (Grabenstein, 2013)

Section 1: Routine Childhood Immunization Schedule for Children who are ON SCHEDULE – 2 Months up to and Including 17 Years of Age

In Alberta, routine childhood immunization begins ideally at two **calendar months** of age. Recommendations for the age at which vaccines are administered are influenced by age-specific risks for disease, age-specific risks for complications, ability to respond to the vaccine, and potential interference with the immune response by passively transferred maternal antibody. Each vaccine manufacturer indicates the minimum age for initiating the vaccine series. (Alberta Immunization Policy, 2015)

This section should be used for all children who are presenting **on time for immunization**. For children who fall behind the routine immunization schedule by **one month or more** refer to *Section 2: Delayed Immunization Schedule for Children/Adolescents up to and Including 17 Years of Age - BEGINNING Immunization BEFORE Their 7th Birthday* and *Section 3: Delayed Immunization Schedule for Children/Adolescents up to and Including 17 Years of Age - BEGINNING Immunization ON/AFTER Their 7th Birthday*. Once they are up to date for age, return to this section to complete the routine age appropriate schedule.

This section is to be used as a summary of the **routine immunization schedule** only. Alternate schedules and/or additional vaccines may be necessary for individuals who are at greater risk for vaccine preventable diseases (e.g., HSCT recipients, children whose family have emigrated from hepatitis B endemic countries, children with chronic health conditions, children who previously lived in a TB endemic country). Children should be assessed at each immunization visit to determine need for vaccines outside of the routine immunization schedule based on risk factors. For detailed schedule information, refer to vaccine biological pages and immunization standards for high risk individuals.

Age at Presentation	Vaccine
2 months	DTaP-IPV-Hib-HB[1] MenC-ACYW[2] (high risk only) PNEU-C15 (healthy) or PNEU-C20[5] (high risk) Rot[3]
4 months	DTaP-IPV-Hib-HB[1] MenconC (healthy) or MenC-ACYW[2] (high risk only) PNEU-C15 (healthy) or PNEU-C20[5] (high risk) Rot[4]
6 months	DTaP-IPV-Hib-HB[1] PNEU-C20[5] (high risk only) MenC-ACYW[2] (high risk only) Rot[6]
6 months of age and older	Annual Influenza[7,8] COVID-19[9]
12 months	MMR-Var[10] MenconC or MenC-ACYW[2] (high risk only) PNEU-C15 (healthy) or PNEU-C20[5] (high risk)
18 months	DTaP-IPV-Hib[11] MMR-Var[10]
4 years of age	Tdap-IPV
Grade 6	HBV (two doses) HPV (two or three doses)
Grade 9	Tdap[12, 13] MenC-ACYW[14]
All foreign-born people up to and including 17 years of age who have originated from a country with high TB incidence and who have arrived within the past five years.	Tuberculin Purified Protein Derivative (PPD)[15]

All refugees and evacuees up to and including 17 years of age originating from countries with high TB incidence AND have arrived in Canada within the past two years.	

[1] As of May 1, 2018, infants born March 1, 2018 or later are eligible for DTaP-IPV-Hib-HB. Infants born prior to March 1, 2018 will continue to receive DTaP-IPV-Hib. The third dose of DTaP-IPV-Hib-HB should not be administered before 24 weeks (6 months) of age.

[2] MenC-ACYW should be given instead of MenconC if individual is high risk as per biological page. The number of doses provided will depend on the age of the individual when they start immunization. When assessing previous immunization records for MenconC, a dose given in the first year of life respecting the minimum age would be considered valid and further doses under 12 months are not required.

[3] For Rotarix® the first dose must not be administered to children who are less than 6 weeks of age or greater than 19 weeks of age. For RotaTeq® the first dose must not be administered to children who are less than 6 weeks of age or greater than 14 weeks of age.

[4] For Rotarix® ideally the second dose should be administered by 24 weeks of age, but if immunization is delayed, the second dose must be administered before 8 calendar months of age.

[5] Healthy children receive Pneumococcal 15 valent Conjugate Vaccine. Children identified as high risk in the Pneumococcal Vaccine Biological pages should receive 4 doses of PNEU-C20 vaccine. See Pneumococcal Vaccine Biological pages for eligibility criteria and appropriate scheduling.

[6] For RotaTeq® the third dose must be administered by 8 calendar months of age, with a minimum of 4 weeks between the second and third doses.

[7] Influenza vaccine is offered as part of routine immunizations for any child 6 calendar months of age or older during influenza season. See Influenza Vaccine Biological Page #07.260.

[8] Children less than 9 years of age require 2 doses given at least 4 weeks apart if they have never received a dose of influenza vaccine in a previous year.

[9] COVID-19 vaccine is offered as part of routine immunizations for any child 6 calendar months of age or older. See the applicable COVID-19 Vaccine Biological Pages for eligibility and scheduling information.

[10] Children 12 months of age and older regardless of a history of varicella disease occurring before 12 months of age. Children who received their first dose of varicella-containing vaccine and at any point subsequently developed laboratory-confirmed vaccine modified varicella disease do not require a second dose of varicella vaccine.

[11] To provide complete protection, 1 dose of Hib-containing vaccine is required at 15 months of age up to 59 months of age, regardless of the number of doses received prior to 15 months of age.

[12] Tdap is recommended for all students in Grade 9 or students 14 up to and including 17 years of age in ungraded classes regardless of the spacing from a previous dose of Td.

[13] Students who have received a dose of tetanus, diphtheria and acellular pertussis containing vaccine at 12 years of age or older do not require the routine Tdap booster in Grade 9.

[14] Students who have received a dose of MenC-ACYW vaccine at 12 years of age or older, i.e., privately purchased, for travel or for medical reasons, do not require the routine MenC-ACYW offered in Grade 9. Students who have received a dose of MenC-ACYW younger than 12 years of age can be offered a dose in Grade 9. See #07.281 Meningococcal Conjugate (Groups A,C,Y and W-135) Vaccine Biological Page.

[15] This is not a universal routine immunization but applies to some individuals. See TB Biological Page #07.330 for eligibility criteria and appropriate scheduling.

Section 2: Delayed Immunization Schedule for Children/Adolescents up to and Including 17 Years of Age - BEGINNING Immunization BEFORE their 7th Birthday

This section is a general guideline to use for children up to and including 17 years of age who **begin immunization BEFORE** their 7th birthday and **fall behind the routine immunization schedule by one month or more**. When determining the late immunization schedule, immunizers must consider or take into account previous documented immunizations received. Once the individual is up to date for age, return to *Section 1 - Routine Childhood Immunization Schedule* to complete the routine age appropriate schedule.

Due to the complexity of determining delayed immunization schedules, this summary **must be used in conjunction with the vaccine specific biological pages and Section 5: *Minimum Age and Minimum Intervals Between Vaccine Doses***. Consult with the zone MOH as required.

Schedule	Vaccine
First visit	DTaP-IPV-Hib[1] or DTaP-IPV-Hib-HB[1] MenconC[2] or MenC-ACYW[3] (high risk only) PNEU-C15[4, 5] (healthy) or PNEU-C20[4,5] (high risk) MMR or MMR-Var[6] (12 months of age and older) Rot[7] (Refer to biological page for maximum age when starting immunization) HBV[1]
Second visit	DTaP-IPV-Hib[1], DTaP-IPV-Hib-HB[1]or Tdap-IPV[1] MenC-ACYW[3] (high risk only) PNEU-C15[4,5] (healthy) or PNEU-C20[4,5] (high risk) Rot[8] HBV[1]
Third visit	DTaP-IPV-Hib[1], DTaP-IPV-Hib-HB[1], Tdap-IPV[1] or Tdap[1] PNEU-C20[4,5] (high risk only) Rot (must be given before 8 calendar months of age)
Fourth visit	DTaP-IPV-Hib[1], Tdap-IPV[1] or Tdap[1] MenconC[2] or MenC-ACYW[3] (high risk only) PNEU-C15[4,5] (healthy) or PNEU-C20[4,5] (high risk) MMR or MMR-Var[9] HBV[1]
Fifth visit	Tdap-IPV[1] or Tdap[1,10]
Other Routine Recommended Immunizations	
Annual Influenza	1-2 doses during the influenza season[11]
COVID-19	See the applicable biological pages for eligibility and scheduling information
Grade 6	HBV (two doses) HPV (two or three doses)
Grade 9	Tdap[12,13] MenC-ACYW[14]
All foreign-born people up to and including 17 years of age who have originated from a country with high TB incidence and who have arrived within the past five years. All refugees and evacuees up to and including 17 years of age originating from countries with high TB incidence AND have arrived in Canada within the past two years.	Tuberculin Purified Protein Derivative (PPD)[15]

[1] Children beginning immunization up to and including 6 years of age should receive a minimum of 4 doses of tetanus/diphtheria/pertussis+/- polio +/- Hib containing vaccine. Refer to vaccine specific biological pages for detailed indication and schedule information.
- For children 2 months up to and including 23 months of age, give DTaP-IPV-Hib-HB vaccine (born March 1, 2018 or later)
- For children 24 months up to and including 6 years of age give DTaP-IPV-Hib vaccine.
- Children who have received a dose of Hib containing vaccine at 15 months of age or older should still receive DTaP-IPV-Hib or Tdap-IPV depending on their age. Note: To provide complete protection, 1 dose of Hib-containing vaccine is required at 15 months of age up to 59 months of age, regardless of the number of doses received prior to 15 months of age.
- Children 7 years of age and older should receive Tdap-IPV to complete their routine immunization series. The reinforcing dose of polio is not required if the third dose was given on or after 4 years of age.
- Hepatitis B given as a 3 dose or 2 dose series dependent on age. Children 11 years of age and older may require only 2 doses. See Hepatitis B Biological Page #07.234 for eligibility criteria and appropriate scheduling.
- Booster dose (4th dose) of polio containing vaccine is recommended for children 4 to 6 years of age usually as a combined vaccine (Tdap-IPV or DTaP-IPV-Hib). This reinforcing dose of polio is not required if the third dose was given on or after 4 years of age.

[2] For children up to and including 4 years of age and presenting for immunization at 4 months of age or older. Depending on age when immunization is received fewer doses may be required. Refer to the Meningococcal Conjugate (Group C) Vaccine Biological Page #07.280.

[3] Number of doses of MenC-ACYW will depend on the age of the individual when they start immunization. See Meningococcal Conjugate Groups A, C, Y, W-135 Biological Page for details.

[4] For healthy children up to and including 59 months of age. Depending on age when immunization is received fewer doses may be required and the interval between doses may differ. Refer to the Pneumococcal 15-valent Conjugate Vaccine Biological Page #07.292.

[5] Children with high risk conditions require up to 4 doses of vaccine depending on the age at which they receive immunization. Refer to the Pneumococcal 20-valent Conjugate Vaccine Biological Page #07.293.

[6] Children presenting for the first visit should have this dose administered on or after 12 months of age. Refer to the Measles, Mumps, Rubella and Varicella Vaccine Biological Page #07.271 for eligibility.

[7] First dose can only be administered to children who are 6 weeks of age up to and including 14 weeks (14 weeks 6 days) of age when starting their immunization with RotaTeq® and up to and including 19 weeks (19 weeks 6 days) of age when starting with Rotarix®.

[8] Ideally second dose of Rotarix® should be administered by 24 weeks of age but if immunization is delayed, the second dose must be administered before 8 calendar months of age. Third dose of RotaTeq® must be administered before 8 calendar months of age, respecting minimum intervals between doses.

[9] An interval of 3 months between doses of varicella containing vaccines is recommended for individuals under 13 years of age and an interval of 6 weeks for individuals over 13 years of age unless they have one of the following conditions: HIV, asplenia/hyposplenia and chronic renal disease. Individuals with these conditions require a minimum spacing of 3 months between doses.

[10] When the fourth dose is administered after the fourth birthday the fifth dose is not necessary.

[11] Influenza vaccine is offered as part of routine immunizations for any child 6 calendar months of age or older during influenza season. See Influenza Vaccine Biological Page #07.260. Children less than 9 years of age require 2 doses given at least 4 weeks apart if they have never received a dose of influenza vaccine in a previous year.

[12] Tetanus, diphtheria and acellular pertussis combined vaccine (Tdap) is recommended for all students in Grade 9 or students 14 up to and including 17 years of age in ungraded classes regardless of the spacing from a previous dose of Td.

[13] Students who have received a dose of tetanus, diphtheria and acellular pertussis containing vaccine at 12 years of age or older do not require the routine Tdap booster in Grade 9.

[14] Students who have received a dose of MenC-ACYW vaccine at 12 years of age or older, do not require the routine MenC-ACYW offered in Grade 9.

[15] This is not a universal routine immunization but applies to some individuals. See TB Biological Page #07.330 for eligibility criteria and appropriate scheduling.

Section 3: Delayed Immunization Schedule for Children/Adolescents up to and Including 17 Years of Age - BEGINNING Immunization ON/AFTER their 7th Birthday

This section is a general guideline to use for children up to and including 17 years of age who **begin immunization ON/AFTER** their 7th birthday and **fall behind the routine immunization schedule by one month or more**. Once they are up to date for age, return to *Section 1 - Routine Childhood Immunization Schedule* to complete the routine age appropriate schedule.

Due to the complexity of determining delayed immunization schedules, this summary must be used in conjunction with the vaccine specific biological pages. Consult with the zone MOH as necessary.

Schedule	Vaccine
First Visit	Tdap-IPV MMR-Var[1] (7 years up to and including 12 years of age) **OR** MMR and Varicella[1] (13 years up to and including 17 years of age)
Second Visit Minimum 4 weeks, 6 weeks or 3 months after 1st visit[2,3]	Tdap-IPV MMR-Var[1] (7 years up to and including 12 years of age) **OR** MMR and Varicella[1] (13 years up to and including 17 years of age)
Third Visit Minimum 6 months after 2nd visit	Tdap-IPV
Other Routine Recommended Immunizations	
Annual Influenza	1-2 doses during the influenza season[4]
COVID-19	See the applicable biological pages for eligibility and scheduling information
Grade 6	HBV (two doses) HPV (two or three doses)
Grade 9	Tdap[5,6] MenC-ACYW[7]
All foreign-born people up to and including 17 years of age who have originated from a country with high TB incidence and who have arrived within the past five years. All refugees and evacuees up to and including 17 years of age originating from countries with high TB incidence AND have arrived in Canada within the past two years.	Tuberculin Purified Protein Derivative (PPD)[8]

1 Varicella vaccine is offered to susceptible persons only. See Varicella Vaccine Biological Page #07.350 for eligibility. For students being immunized as part of the school immunization program, pre-immunization serology is not required.

2 In order to ensure adequate protection as soon as possible for each vaccine, this visit may need to be broken into 2 different appointments.

3 Depending on which live vaccine is used and the age at which the vaccine is being given, the eligibility for vaccine and the interval will change. Refer to specific vaccine biological pages for detailed information on vaccine indications and scheduling.

4 Influenza vaccine is offered as part of routine immunizations for any child 6 calendar months of age or older during influenza season. See Influenza Vaccine Biological Page #07.260. Children less than 9 years of age require 2 doses given at least 4 weeks apart if they have never received a dose of influenza vaccine in a previous year.

5 Tdap is recommended for all students in Grade 9 or students 14-17 years of age in ungraded classes regardless of the spacing from last Td booster.

6 Students who have received a dose of tetanus, diphtheria and acellular pertussis containing vaccine at 12 years of age or older do not require the routine Tdap booster in Grade 9.

7 Students who have received a dose of MenC-ACYW vaccine at 12 years of age or older do not require the routine MenC-ACYW offered in Grade 9.

8 This is not a universal routine immunization but applies to some individuals. See TB Biological Page #07.330 for eligibility criteria and appropriate scheduling.

Section 4: Adult Immunization Schedule – For 18 Years of Age and Older Beginning or Completing an Immunization Series

This section is a general guideline to use for routine adult immunization. For information related to vaccine recommended for adults with high risk conditions or adults requiring assessment of immunization status for occupational purposes refer to the vaccine specific biological pages.

Schedule	Antigen
First Visit	Tdap[1], Tdap-IPV[1], or IPV[1] MMR[2, 3] VZ[4] Influenza[5] COVID-19[6] PNEU-C20[7](high risk) HBV[8] HPV[9]
Second Visit Minimum 4 weeks or 6 weeks after 1st visit[10,11]	Tdap[1] or IPV[1] MMR[2] VZ[4, 11] HBV[8] HPV[9]
Third Visit Minimum 6 months after 2nd visit	Tdap[1] or IPV[1] HBV[8] HPV[9]
Every 10 years	Tdap[1]
Pregnant Persons with every pregnancy	Tdap
All foreign-born people less than 65 years of age who have originated from a country with high TB incidence and who have arrived within the past five years. All refugees and evacuees aged less than 65 years originating from countries with high TB incidence AND have arrived in Canada within the past two years.	Tuberculin Purified Protein Derivative (PPD)[12]

[1] Effective January 1, 2021 Tdap vaccine replaced Td vaccine. Primary immunization for polio is recommended for those who have not completed a series and for those at high/increased risk. Reinforcing dose of polio is recommended for specific groups. For more information regarding eligibility criteria see #07.300 Polio Vaccine Biological page.

[2] See Mumps, Measles and Rubella Vaccine Biological Page #07.270 for eligibility criteria.

[3] When reviewing records, any doses of Killed Measles Vaccine (KMV) should be considered invalid. A dose of live attenuated measles vaccine should be offered at least 4 months following the killed vaccine to be considered a valid dose.

[4] Varicella vaccine is offered to susceptible persons only. See Varicella Vaccine Biological Page #07.350 for eligibility.

[5] Recommended once annually for all persons during influenza season.

[6] See the applicable COVID-19 biological pages for eligibility and scheduling information.

[7] See Pneumococcal Conjugate 20-valent Vaccine Biological Page #07.293 for eligibility criteria.

[8] See Hepatitis B Biological Page #07.234 for eligibility criteria and appropriate scheduling.

[9] See Human Papillomavirus 9-valent biological page #07.241 for eligibility criteria and appropriate scheduling.

[10] In order to ensure adequate protection as soon as possible for each vaccine, this visit may need to be broken into 2 different appointments.

[11] If varicella vaccine is not needed, the second dose of MMR and/or tetanus, diphtheria and polio containing vaccines must be given a minimum of 4 weeks after dose 1. If varicella vaccine is needed, an interval of 6 weeks is recommended for individuals over 13 years of age unless they have one of the following conditions: HIV, asplenia/hyposplenia and chronic renal disease. Individuals with these conditions require a minimum spacing of three months between doses. See Varicella Vaccine Biological Page #07.350

[12] This is not a universal routine immunization but applies to some individuals. See TST Biological Page #07.330 for eligibility criteria and appropriate scheduling.

.*Section 5: Minimum Age and Minimum Intervals Between Vaccine Doses*

This section should not be used to determine eligibility for vaccine. Once it is determined an individual is eligible for vaccine, minimum intervals can be used for those who start an immunization series outside the routine schedule, those who fall behind the routine immunization schedule by one month or more or those for whom rapid protection is required, except in some specific situations. Use this table in conjunction with the vaccine biological pages. **Once the individual is on schedule (up to date for age) use the recommended spacing rather than the minimum intervals.**

Individuals who are at greater risk for vaccine preventable diseases (e.g., HSCT recipients, SOT candidates and recipients, children whose family have emigrated from hepatitis B endemic countries, children with chronic health conditions) have very specific immunization schedule recommendations. For those individuals follow the recommendations outlined in the vaccine biological pages.

Vaccine	Minimum Age for First Dose	Minimum Interval Between Dose			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
DTaP-IPV-Hib[1]	6 weeks	4 weeks	4 weeks	6 months[1]	6 months[2]
DTaP-IPV[3]	8 weeks	4 weeks	4 weeks	6 months	6 months[2]
HAV	6 months	6 months			
HABV	1 year	4 weeks	5 months		
IPV[4]	6 weeks	4 weeks	6 months[5]	6 months[5]	
Influenza	6 calendar months	4 weeks[6]			
MMR[7]	1 year[8]	4 weeks			
MMR-Var[7]	1 year	4 weeks[17]			
Men-B	8 weeks	Refer to biological page	Refer to biological page	Refer to biological page	
MenconC[9]	8 weeks	4 weeks	4 weeks[10]		
MenC-ACYW	8 weeks	4 weeks	4 weeks	8 weeks	3 years / 5 years
PNEU-C15[21] (3 doses)	6 weeks	4 weeks	8 weeks		
PNEU-C20[22] (high risk) (4 doses)	6 weeks	4 weeks	4 weeks	8 weeks	
PNEU-C13[21] (3 doses)	6 weeks	4 weeks	8 weeks		
PNEU-C13[22] (4 doses)	6 weeks	4 weeks	4 weeks	8 weeks	
PNEUMO-P[22]	2 years	5 years	5 years		
RAB (pre-exposure)	birth	7 days	14 to 21 days		
RAB (post-exposure)	birth	3 days[11]	4 days[16]	7 days[16]	14 days[16]
Rot	6 weeks[12]	4 weeks[13]	4 weeks[14]		
Td[23]	7 years	4 weeks	6 months		
Tdap-IPV[1, 15]	4 years	4 weeks	6 months		
Tdap[1, 16, 23]	4 years	4 weeks	6 months		
TYVI injectable	2 years	3 years			
VZ[17]	1 year	4 weeks[17]			

Vaccine	Minimum Interval Between Dose			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 1 to Dose 3
DTaP-IPV-Hib-HB	6 weeks	4 weeks	8 weeks[18]	16 weeks[19]
HBV (3 dose schedule)	birth	4 weeks	8 weeks[19]	4 months[19] (112 days)
HBV (2 dose schedule)	11 years	6 months (24 weeks)	NA	NA
HPV (3 dose schedule)	9 years	4 weeks	12 weeks	6 months[19] (24 weeks)
HPV (2 dose schedule)	9 years	6 months (24 weeks)	NA	NA

[1] To determine which tetanus-diphtheria containing vaccine to use see tetanus-containing vaccine biological pages. Note: if 4th dose of DTaP-IPV-Hib is given before 15 months of age, a reinforcing dose of Hib vaccine should be offered at 15 months of age or older with a minimum spacing of 8 weeks after the last Hib dose.

[2] Minimum age for 5th dose is 4 years of age; if 4th dose is given on or after 4 years of age, 5th dose is not required.

[3] DTaP-IPV-Hib replaced DTaP-IPV on June 1, 2017 as DTaP-IPV no longer available.

[4] In order to have a complete series for polio vaccine the individual must have received a minimum of 2 doses 4 weeks apart with a third dose a minimum of 6 months from the previous dose. Additional doses may have been given for convenience when using combined vaccine.

[5] Must have at least one dose at 4 years of age or older.

[6] Second dose if required as per influenza vaccine biological page.

[7] For historical immunization record assessment, a minimum interval of 4 weeks must separate live vaccines (MMR, MMR-Var and Vz) for healthy individuals.

[8] MMR may be given as early as 6 months if indicated:

- A dose of MMR vaccine given prior to 12 months of age is not considered to be valid.
- Vaccine should be repeated on or after the first birthday (12 months of age) with a minimum interval of 4 weeks from the early/null dose.
- The repeat dose at 12 months of age can be given as MMR or MMR-Var.

[9] On January 1, 2015 the routine meningococcal C conjugate immunization program changed to a 2-dose schedule (routinely given at 4 and 12 months of age). When assessing previous immunization records for MenconC, a dose given in the first year of life respecting the minimum age would be considered valid and further doses under 12 months are not required.

[10] At least one dose must be given in the second year of life. See Pneumococcal Conjugate Vaccine Biological pages for eligibility criteria and appropriate scheduling.

[11] If a dose in the routine post exposure prophylaxis schedule is missed, consult with the MOH. Series should be resumed as soon as possible respecting the minimum intervals.

[12] The first dose of Rot must be administered before 15 weeks (RotaTeq®) or 20 weeks of age (Rotarix®).

[13] The 2nd dose of Rotarix® must be administered before 8 calendar months of age.

[14] A 3rd dose of Rot is required if any dose in the series was RotaTeq® or unknown. All doses must be given before 8 calendar months of age, respecting intervals between doses.

[15] Tdap-IPV is licensed for use in persons 4 years of age and older as a booster dose. It is currently used off label for primary immunization of individuals 7 years of age and older.

[16] Tdap is licensed for use in persons 4 years of age and older as a booster dose. It is currently used off label for primary immunization of individuals 7 years up to and including 17 years of age when polio is not indicated.

[17] An interval of 3 months between doses of varicella containing vaccines is required for those who have one of the following conditions: HIV, asplenia/hyposplenia and chronic renal disease. Refer to varicella vaccine biological page.

[18] The minimum age for the third dose is 6 months (24 weeks, 168 days) of age and all minimum intervals for the three doses must be met.

[19] When reviewing immunization records, for HPV4 vaccine, if the third dose was administered at less than the interval outlined, the dose can be considered valid and vaccine would not need to be repeated if there is a minimum interval of at least 4 months (16 weeks) between the first and third dose. This spacing must not be used to schedule immunization appointments/school rounds. This direction does not apply to HPV9.

[21] Pneu-C15 replaced Pneu-C13 on June 24, 2024 for healthy children.

[22] Pneu-C20 replaced Pneu-C13 (4-dose schedule) on June 24, 2024 for high risk children. Pneu-C20 replaced Pneumo-P on June 24, 2024 for healthy adults 65 years of age and older and for high risk individuals. See Pneumococcal Conjugate Vaccine Biological pages for eligibility criteria and appropriate scheduling.

[23] Tdap replaced Td as of January 1, 2021.

Section 6: *Guidelines for Spacing of Inactivated and Live Vaccines*

Vaccines are safe and effective when administered simultaneously. All vaccines due should be given at the same clinic visit when possible. Concurrent administration of all vaccines for which the individual is eligible increases the probability that they will be fully immunized at the appropriate age.

- Two or more vaccines can be administered on the same day, providing there are no special contraindications.
- Live vaccines must be given on the same day or separated by minimum interval as outlined in the vaccine biological page for the vaccine being provided. Refer to vaccine specific biological pages for more information.

Vaccine	Recommended Minimum Interval Between Doses
2 or more inactivated vaccines	None; can be administered simultaneously or at any interval between doses
Inactivated plus any live vaccine	None; can be administered simultaneously or at any interval between doses
2 or more live vaccines	4 weeks up to 3 months as outlined in the specific vaccine biological pages. • Live oral vaccines (e.g., oral typhoid, oral poliovirus and oral rotavirus vaccines) can be administered simultaneously or at any interval before or after injectable vaccines (inactivated or live). • Intranasal live vaccine (e.g., FluMist vaccine) may be administered any time before or after the administration of other live attenuated or inactivated vaccines. o Specialists recommending alternate spacing for specific high risk individuals may be accommodated on a case by case basis. • With non-provincially funded live vaccines, refer to the product monograph for spacing recommendations.

Section 7: Guidelines for Interval Between Immune Globulin and other Blood Products and Live Vaccines

The immune response to some live vaccines may be diminished when given 2 weeks before or during the several months after receipt of immune globulin (IG) or other blood products. Administration of IG preparations or blood products does not interfere with antibody responses to yellow fever vaccine, oral vaccines (typhoid, polio, rotavirus) or BCG and is not expected to affect response to live-attenuated influenza vaccine. Administration of IG preparations or blood products and inactivated vaccines has not been demonstrated to inhibit the immune responses to the inactivated vaccines.

Concurrent administration of recommended doses of hepatitis B, tetanus and rabies immune globulin products and the corresponding inactivated vaccine for post exposure prophylaxis provides immediate protection from the IG product and long term immunity from the vaccine. It does not impair the effectiveness of the vaccine. These products must be administered in different limbs.

Immune Globulin or Blood Product	Dose	Interval between receipt of Ig or blood product and subsequent administration of MMR, MMR-Var or VZ vaccine (months)
Standard Immune Globulin (human)		
IG (Immune Globulin)	0.02 to 0.06 mL/kg	3
	0.1 mL/kg	3 **Note:** Alberta Health has indicated when IMIG has been administered for Hepatitis A post exposure utilizing a dosage of 0.1 mL/kg of body weight, the recommended interval between IMIG and live vaccines is 3 months.
	0.25 mL/kg	5
	0.5 mL/kg	6
IVIg (Intravenous Immune Globulin) or SCIg (Subcutaneous Immune Globulin[1])	300 – 400 mg/kg	8
	1000 mg/kg	10
	2000 mg/kg	11
Specific Immune Globulin (human)		
Cytomegalovirus immune globulin (CMVIg)	150 mg/kg IV	6
Hepatitis B immune globulin (HBIG)	0.06 mL/kg	3
Rh immune globulin (RhIg)	300 mcg	3 **Note:** If MMR or varicella containing vaccine is given to susceptible women less than 3 months from receipt of RhIg, serological testing should be done 3 months after the vaccine dose to assess the immune response.
Rabies Immune Globulin (RIG)	20 IU/kg	4
Tetanus Immune Globulin (TIG)	250 units	3
Varicella Zoster Immune Globulin (VZIG)	12.5 units/kg	5
Specific immune globulin (humanized monoclonal antibody)		
Palivizumab (Synagis™)[2]	15 mg/kg/4 weeks	No wait Note: monoclonal antibody which does not interfere with live vaccine

Blood Products	Interval (months)
Packed Red Blood Cells (RBCs)	5
Plasma or Platelets	7
Reconstituted RBCs	3
Washed RBCs	No wait
Whole Blood	6
Albumin	No wait
Clotting factors	**Note**: Recombinant clotting factor concentrates are free of immune globulins. High and intermediate-purity plasma-derived clotting factor concentrates will likely contain some immune globulins but much smaller amounts than immune globulin products. Case by case consult with physician providing care is recommended before proceeding with immunization.

[1] Ig can also be administered subcutaneously (SCIg). SCIg is primarily indicated as life-long replacement therapy in patients with primary antibody deficiencies for whom immunization with live vaccines is contraindicated. However, potential alternative indications for SCIg therapy may result in temporary use and discontinuation of therapy. Because pharmacokinetic properties of IgG following SCIg administration have been shown to resemble those following IVIg administration, the recommended interval between the administration of SCIg and MMR, MMRV or univalent varicella vaccines should be considered equivalent to the recommended interval after the corresponding IVIg monthly dosing.

[2] RSV IG (Respigam) is no longer available in Canada. Palivizumab (Synagis™) is not referred to as RSV IG.

Section 8: *Immunization Following Vaccine Administration Errors*

The following are general guidelines related to recommendations following vaccine administration errors. For errors that are not listed here, consultation with the MOH/MOH designate is required to determine how best to proceed.

Inactivated Vaccine Given at Less than the Minimum Interval

With the exception of pneumococcal polysaccharide and DTaP-IPV-Hib-HB vaccines (see below), if a vaccine dose is administered 5 or more days earlier than the minimum interval between doses, it will be considered invalid and the vaccine dose will need to be repeated.

- The repeat dose should be spaced after the invalid dose by the recommended minimum interval for the specific dose of that vaccine.
- Refer to ***Section 5: Minimum Intervals Between Vaccine Doses***

With the exception of rabies vaccine, if a vaccine dose is administered 4 days or less than the minimum interval between doses, the dose can be considered valid.

If DTaP-IPV-Hib-HB vaccine has been administered earlier than the minimum intervals outlined on the vaccine biological page, as long as there are 28 days between doses, the vaccine can be considered valid. A dose of DTaP-IPV-Hib-HB vaccine will be required at the routine 18-month appointment in order to complete the hepatitis B series.

If pneumococcal polysaccharide vaccine has been administered earlier than the minimum 5 year interval, consider all administered doses of pneumococcal polysaccharide vaccine valid regardless of the interval between doses. No further doses of pneumococcal polysaccharide vaccine should be given with the exception of a single dose of pneumococcal polysaccharide vaccine at 65 years of age or older, respecting the minimum 5 years interval from a previous dose

Live Injectable/Oral/Intranasal Vaccines Given at Less than the Minimum Interval

If two live injectable vaccines are not given on the same day and are given less than 28 days apart, consider the vaccine that was given second to be invalid. These recommendations do not apply to live oral vaccines.

- Repeat the vaccine that was given second using the minimum interval after the invalid dose.

Oral poliomyelitis vaccine (OPV) should be given at least 2 weeks apart from rotavirus vaccine. OPV is not available in Canada. If historical records indicate rotavirus vaccine and OPV are given at less than 2 weeks apart, consider both vaccines as valid doses.

Intranasal live vaccine (e.g., FluMist vaccine) may be administered any time before or after the administration of other live attenuated or inactivated vaccines.

- Specialists recommending alternate spacing for specific high risk individuals may be accommodated on a case by case basis.

Vaccine Given at Less than the Minimum Age

If an inactivated vaccine is administered 5 or more days earlier than the minimum age it will be considered invalid and the vaccine dose will need to be repeated.

- Repeat the dose when the individual reaches the minimum age and at least the minimum interval from the dose that was given too early.

If an inactivated vaccine dose is administered 4 days or less than the minimum age, the dose can be considered valid.

If a live vaccine dose is given at less than the minimum age it will be considered invalid and the vaccine dose will need to be repeated.

- Repeat the dose when the individual reaches the minimum age and at least the minimum interval from the dose that was given too early.

Immunization when less than the Recommended Dose is Given

The recommended dosage for each vaccine is based on information from clinical trials from the manufacturer and clinical experience of post-licensure use of the vaccines. With the exception of clients undergoing allergy testing, vaccine doses should not be altered from the recommendations outlined in the vaccine biological pages as this may result in less than optimal protection, or excessive local or systemic reactions.

- If the volume of vaccine administered is **known** (e.g., a pediatric dose was administered instead of an adult dose):
  - Give the remainder of the dose on the same day.
  - If the error is not noticed on the same day, repeat the entire dose as soon as possible.
- If the volume of the vaccine given is **not known** (e.g., leakage from the syringe, child pulls away from the needle before the entire dose can be administered):
  - The entire dose should be repeated immediately, if possible.

Expired Vaccine

If an expired product is given inadvertently, contact the MOH/MOH designate for recommendations regarding re-immunization. If the MOH/MOH designate determines the dose needs to be repeated, use the following guidelines for spacing:

- If it is a live vaccine, give on the same day as the expired vaccine was given. If the error is discovered after that, repeat the dose of live vaccine using the minimum intervals from the expired dose.
- If it is an inactivated vaccine, give the repeat dose as soon as possible.

Vaccine Given by Incorrect Route

- If a vaccine recommended to be given subcutaneously (SC) is inadvertently given by the intramuscular (IM) route, the dose can be considered valid and does not need to be repeated.
- If a vaccine recommended to be given IM, is inadvertently given SC, or for other variations from the recommended route, the MOH/MOH designate should be consulted to determine whether a repeat dose is necessary.

MMR-Var Given to Person 13 Years of Age or Older

MMR-Var is not licensed for use in persons 13 years of age and older. Limited data is available on the efficacy of the vaccine in this age group. Based on consultation with AHS Medical Officers of Health, the following is recommended if the vaccine is inadvertently administered to a person 13 years of age and older:

- The MMR portion of the combined vaccine can be considered valid and would not need to be repeated.
- The varicella component of the vaccine would not be considered valid and would need to be repeated using univalent varicella vaccine with a 3 month interval from the invalid dose of MMR-Var that was administered.

Additional doses of MMR or varicella vaccine, if needed, should be given according to intervals outlined in the vaccine biological pages.

Errors Involving Varicella & Herpes Zoster (Shingrix®) Vaccines

The following is recommended if inadvertent administration of incorrect product occurs:

- If varicella vaccine was indicated and Shingrix® vaccine was given in error, there is no waiting period and live varicella vaccine can be given as soon as possible. Shingrix® cannot be used to prevent primary varicella infection and the dose should be considered invalid.
- If Shingrix® was indicated and a dose of live varicella vaccine was given in error, then Shingrix® may be given with a minimum interval of 8 weeks from the varicella vaccine. The dose of varicella vaccine may be considered valid.

Vaccine Containing Lesser Amount of diphtheria/pertussis Component

- If any dose of Tdap containing vaccine has been given to a child under 4 years of age, the dose should be considered invalid and repeated as soon as feasible.
- If Tdap containing vaccine has been given to a child over 4 but under 7 years of age:
  - If given as dose 1, 2 or 3, the dose should be considered invalid and repeated as soon as feasible.
  - If given as dose 4, the dose can be considered valid and does not have to be repeated.
- If DTaP containing vaccine has been given when Tdap was indicated, the dose can be considered valid, and does not have to be repeated.

Section 9: Alternate Schedules Used to Assess Completeness of Previous Immunization Received

When an individual presents with an immunization record from out of province or out of country, it can be difficult to determine if they are considered up to date for age. Individuals presenting with a history of being immunized according to the following schedules can be considered to be appropriately immunized for age.

Alternate Immunization Schedule for Hepatitis B and Combined Hepatitis A and Hepatitis B Vaccine

These schedules may have been used for hepatitis B or hepatitis A/B combined vaccine (e.g., for the purpose of travelling, or schedules used for provincially funded programs in other provinces). Individuals immunized under these schedules will be considered appropriately immunized for age.

Vaccine		Dose 1	Dose 2
Recombivax® Hepatitis B For use in children 11 to 15 years of age	**1 mL dose**	Day 0	4-6 months after dose 1
Engerix® Hepatitis B For use in children 11 to 15 years of age	**1 mL dose**	Day 0	6 months after dose 1
Twinrix® Hepatitis A and B For use in children 1 to 15 years of age	**1 mL dose**	Day 0	6-12 months after dose 1

Rapid Immunization Schedule for Hepatitis B and Combined Hepatitis A and Hepatitis B Vaccine

These schedules may have been used for hepatitis B or hepatitis A/B combined vaccine (e.g., for the purpose of travelling, or schedules used for provincially funded programs in other provinces). Individuals immunized under these schedules using the correct dose for age will be considered appropriately immunized. These are absolute minimum intervals, the 4 day rule cannot be applied to rapid immunization schedules for hepatitis B and combined hepatitis A and B vaccines.

Vaccine	Dose 1	Dose 2	Dose 3	Dose 4
Engerix® Hepatitis B Rapid For use in persons 20 years of age and older	Day 0	Day 7	Day 21	12 months after dose 1
Engerix® Hepatitis B Accelerated For all ages	Day 0	1 month after dose 1	2 months after dose 1	12 months after dose 1
Recombivax® Hepatitis B Accelerated For all ages	Day 0	1 month after dose 1	4 months after dose 1	-
Twinrix® Combined Hepatitis A and B For persons 19 years of age and older	Day 0	Day 7	Day 21	12 months after dose 1

Section 10: Guideline for Converting a Combined Hepatitis A and B Vaccine Series to a Single Antigen Series

The following table provides guidelines for completing an immunization series started with combined hepatitis A and B vaccine (HABV) and completing with single antigen vaccines.

Initially Immunized with HABV	To complete with single antigen Hepatitis A vaccine	To complete with single antigen Hepatitis B vaccine
One dose	Give dose at time of presentation (minimum 4 weeks after dose of HABV), followed by another dose 6 months later	Complete using the HABV schedule
Two doses	Give dose at least 6 months after the last dose of HABV	
One dose (1 mL) between 1-15 years of age	Give dose at time of presentation (minimum 4 weeks after dose of HABV), followed by another dose 6 months later	Complete using 1 mL Engerix-B a minimum of 6 months after HABV (client must be 11-15 years of age)

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