Assessment Prior to Vaccine Administration

Revision Date: April 12, 2024

Rationale for Update:

- Updated antiviral therapy section.

Assessment Expected Prior to Administering Vaccines

Prior to administering any vaccine, assess the individual's state of health and other factors that may increase the risk of a serious adverse event following the immunization. Along with this assessment, consider the following references in the decision to immunize: *Alberta Immunization Policy*, the *Canadian Immunization Guide*,[1] and the manufacturer's product monograph or directional leaflet. Where recommendations in *Alberta Immunization Policy* differ from the manufacturer's recommendations or the *Canadian Immunization Guide*, *Alberta Immunization Policy* recommendations should be followed.

Assess the following factors prior to administering any vaccine:

- Age and weight (if preterm infant).
- Current immunization record.
- Type of vaccine to be administered (inactivated or live, attenuated) and route of administration.
- Contraindications or precautions including:
    - Current state of health, including any concerns with the immune system;
    - Medications taken in past 3 months that may have caused immunosuppression (e.g. high dose corticosteroids, cancer treatments, etc.);
    - Previous adverse events following immunization;
    - History of allergy, particularly anaphylactic reactions to any substance;
    - Past health history;
    - Pregnancy/lactation;
    - Receipt of blood transfusions or antibody-containing blood products within the past year;
    - Receipt of vaccines within the previous four weeks (Exception: yellow fever where there is a minimum 30 day interval recommended).

Contraindications

A situation in which a vaccine should not be used because the risk outweighs any potential therapeutic benefit[1] (for example, anaphylaxis.)

Precautions

Conditions that may increase the risk of an adverse event following immunization or that may compromise the ability of a vaccine to produce immunity.[1] Generally, vaccines are deferred when a precaution is present. However, there may be circumstances when the benefits of administering the vaccine outweigh the potential harm or when reduced vaccine immunogenicity may still result in significant benefit to an individual.[1]

- Informed consent, including discussion of risks of disease, benefits of the vaccine, the expected vaccine side effects and possible adverse events following immunization.

  See *Biological Products* for further details on each vaccine including precautions, contraindications, expected reactions, and pregnancy.

- Refer to:
    - Adverse Events Following Immunization (AEFI) Policy[2]
    - Active Surveillance and Reporting of Adverse Events following COVID-19 Immunization[3]

  If, after consideration of these factors, a clear decision on whether or not to administer vaccine cannot be reached, the public health nurse should seek direction from the local MOH/designate. Medical consultation may also be needed if there are questions pertaining to the health status of the individual.

Age and Weight

- Routine primary immunization begins at two months of age. When an infant is going to be at particularly high risk for disease (e.g., travel), routine primary immunization may be started at six weeks of age with the exception of meningococcal conjugate C vaccine (minimum age is eight weeks).[1]
- Preterm infants (less than 37 weeks gestation)[1,4] have lower concentrations of maternal antibodies and a shorter duration of maternal protection.[1] They are also at greater risk for some vaccine-preventable diseases. Premature infants (in satisfactory clinical condition) should be immunized at the same chronological age (based on birth date, not corrected gestational age) as full-term infants, using the routine immunization schedule for infants.[1,4] Vaccine doses should not be reduced or divided for the premature infant.[5]
    - Passive transfer of maternal antibodies occurs after the 28th week of gestation. Therefore, premature infants born after 28 weeks of gestation will have maternally derived antibodies, but at lower concentrations and for a shorter duration than full-term newborns. Premature infants of less than 28 weeks gestation are not expected to have significant amounts of maternal antibody. Thus, premature infants may experience increased frequency and severity of vaccine preventable illnesses and should be protected from vaccine preventable disease through timely immunization.[1]
- Infant weight is not a limitation to the commencement of immunization.[5] Most preterm and low birth weight (less than 2,500 g) babies produce sufficient vaccine-induced immunity to prevent disease and tolerate most childhood vaccines as well as term infants.[4]
- Premature and very low birth weight babies (e.g., 1,500 g) still hospitalized at the time of immunization may experience a transient increase or recurrence of apnea and bradycardia following immunization.[1] It is recommended that hospitalized premature infants have continuous cardiac and respiratory monitoring for 48 hours after their first immunization.[1,4]

Specific Contraindications and Precautions

1. Health Conditions

- Immunocompromised Individuals
    - Generally, immunocompromised individuals should not receive live vaccines due to the risk of disease caused by the vaccine strains. In some immunocompromised people the benefits of immunization with routinely recommended live vaccines may outweigh the risk. When considering immunization of an immunocompromised person with a live vaccine or if there is uncertainty about the individual's immune status, approval from the individual's attending physician should be obtained before immunization.[1]

    For more information see:

    - Immunization of Specific Populations (Immunocompromised and Chronic Health Conditions)
    - Immunization for Child Hematopoietic Stem Cell Transplant Recipients
    - Immunization for Adult Hematopoietic Stem Cell Transplant Recipients
    - Immunization for Children Expecting Solid Organ Transplant before 18 Months of Age
    - Immunization for Children Expecting Solid Organ Transplant at 18 Months of Age or Older
    - Immunization for Adult Solid Organ Transplant Candidates and Recipients
- Suspicious family or medical history for immunodeficiency disorders
    - Individuals who have a suspicious history for immunodeficiency disorders (e.g. known or suspected family history of congenital immunodeficiency disorder or undiagnosed maternal HIV infection, or history of failure to thrive and recurrent infections) should not receive live vaccines until they have been investigated and immunodeficiency disorder has been ruled out. Immunodeficiency states may be undiagnosed in young children presenting for routine immunizations, which include live vaccines.[1]
- Bleeding disorders
    - Intramuscular injections should be given with care to individuals with bleeding disorders.
    - Optimize control of bleeding disorder before immunization.[1]
    - Give intramuscular injections with a small gauge needle and apply firm pressure to the injection site for 5 to 10 minutes.[1]

Assessment Prior to Vaccine Administration

2. Surgery or Concurrent Illness

- Minor surgery, including dental procedures, is not a contraindication to immunization regardless of when the procedure is done (i.e., before or after immunization).
- Generally, individuals with minor or moderate acute illness may receive vaccine. There is no increase in risk of adverse events and no interference with the response to the vaccine.[1]
- The risks and benefits of immunizing a severely ill person need to be carefully assessed. The benefits of protection and opportunity to immunize need to be weighed against the possibility that a vaccine-related adverse event could complicate the medical management of the person or that events related to the illness may be misperceived as vaccine-related events.[1] Expert consultation is recommended in these situations.
- Recent exposure to an infectious illness (e.g., chickenpox) is not a contraindication to immunization.[5]

3. Medications

- *Antibiotic therapy* does not interfere with inactivated vaccines or live vaccines with the exception of oral typhoid vaccine.[1]
- *Anticoagulation therapy* does not need to be discontinued before administering immunization and the individual can be safely immunized through either the intramuscular or subcutaneous route (as recommended for the vaccine product).[1] Give intramuscular administration with a small gauge needle (23 gauge or smaller) and apply firm pressure to injection site for 5 to 10 minutes.[1]
- *Antiviral therapy*:
    - Varicella-containing vaccine should not be administered to individuals on antiviral medication for varicella zoster virus (e.g., acyclovir, valacyclovir , famciclovir).[1] These medications should be discontinued from at least 24 hours before administration of the vaccine and not restarted until at least 14 days following immunization.[1]

4. Allergies

Inquiring about allergies to differentiate between minor allergic reactions and severe hypersensitivity reactions should be routine prior to any immunization. A history of an allergy is not necessarily a contraindication to immunization. However, reported anaphylaxis following a specific vaccine or exposure to one of the components contained in the vaccine is generally a contraindication to further doses of the vaccine. The manufacturer's product information should be consulted to identify specific vaccine components if allergies are identified.[1]

➢ Anaphylaxis:

- Anaphylaxis is rare following immunization, with estimated occurrence of 1.3 episodes per million doses of vaccine administered.[1] However, anaphylaxis following immunization is potentially life-threatening and requires immediate medical attention.
- Prevention and management of anaphylaxis is critically important and should be anticipated with every immunization.[1] The following measures need to be in place prior to administration of vaccines:
    - All provincially funded biologicals must be administered in settings where protocols for management of anaphylaxis are in place and can be effectively implemented. Consult *Alberta Health Services' Guidelines*, as well as the *Canadian Immunization Guide*; Anaphylaxis and other acute reactions following vaccination: Canadian Immunization Guide - Canada.ca.[1] Equipment and medication outlined in these guidelines must be available in all settings whenever provincially funded biologicals are administered.
    - Individuals must be advised to remain under observation for at least 15 minutes following receipt of vaccines.[1] Those who have had a previous anaphylactic reaction to any agent (vaccines, biologicals, drugs, food, bee stings, etc.) should have the observation period extended to at least 30 minutes. In low risk situations, supervision can include having recipients remain within a short distance of the immunizer (e.g., within a school).[1]

- Anaphylaxis following immunization needs to be assessed by the local Medical Officer of Health (MOH).

➢ Specific Allergens:

- Latex Allergy

  The packaging of some biological products (vial stoppers, syringe plungers or needle shields) is made with natural rubber that may contain latex. Special care and consideration are required if anaphylaxis to latex has occurred in the past, as listed below:

  - Vaccines supplied in vials or syringes that contain natural rubber should not be administered, unless the benefit of immunization clearly outweighs the risk for a potential allergic reaction;[6]
  - An equivalent biological product by a different manufacturer with latex-free packaging may be available;
  - If an equivalent biological product with latex-free packaging is not available, seek medical consultation. If the decision is to proceed with the biological product, it should be administered in a controlled setting (e.g., urgent care) with an observation period of at least 30 minutes;
  - For latex allergies other than anaphylaxis (e.g., contact sensitivity), biological products supplied in vials or syringes that contain latex may be administered.[1,6]

  Note: Synthetic rubber and synthetic latex do not contain natural rubber or natural latex and therefore, do not contain the impurities linked to allergic or anaphylactic reactions.

- Hypersensitivity to Egg and Egg-related Antigens
  - Measles and mumps-containing vaccines
    - Egg allergy is not a contraindication to immunization with measles/mumps-containing vaccines (virus grown in chick embryo cell culture).[1] The minute quantity of egg proteins contained in measles/mumps-containing vaccines appears to be insufficient to cause an allergic reaction in egg-allergic people.[1]
    - Studies of egg-allergic individuals have shown that there is no increased risk of severe allergic reactions to MMR/MMR-Var vaccines.[1]
    - Prior egg ingestion is not a prerequisite for immunization with measles/mumps-containing vaccines.[1]
  - Inactivated Influenza Vaccine (IIV) and Live Attenuated Influenza Vaccine (LAIV)
    - Egg allergy is not a contraindication to immunization.[1]

    See the following for current information:

    - *Biological Products – Influenza Vaccine (for IIV)*
    - Statement on Seasonal Influenza Vaccine for 2018-2019 (for LAIV).

5. Pregnancy

- Live vaccines are generally contraindicated during pregnancy.[1]
- Most routine inactivated vaccines may be administered to pregnant women when indicated. However, human papillomavirus vaccine (HPV) is not recommended for pregnant women.[1]

See *Biological Products* for specific information on each vaccine.

6. Immune Globulin (IG) Preparations or Blood Products:

Passive immunization with immune globulins or receipt of blood products can interfere with the immune response to certain measles or varicella-containing live viral vaccines. IG or blood products administered at the same time, shortly before or after the measles, mumps, rubella or varicella containing vaccines may reduce the effectiveness of the vaccine.[1]

- The recommended interval between administration of immune globulin/antibody-containing blood product and subsequent immunization with live vaccines varies from 0 - 11 months, depending upon the product used and the dose administered. The *Canadian Immunization Guide (CIG) Part 1 Blood products, human immune globulin and timing of immunization*[1] provides guidelines for the interval between the administration of immune globulin preparations and MMR or varicella-containing vaccines and is included below.
- If IG or blood products are administered less than 14 days after the receipt of MMR, MMR-Var or VZ vaccines, the vaccine should be repeated after the recommended interval as outlined in the CIG.[1]
    - If a measles or varicella post-exposure is required sooner than the recommended interval, a case-by-case consultation with the local Medical Officer of Health is recommended.
    - 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.[7] A case-by-case conference with the physician providing care is recommended before proceeding with immunization.[7]
    - Rh immune globulin (RhIg) may interfere with the response to rubella and varicella vaccines.
        - Women who receive RhIg and are non-immune to rubella should receive MMR vaccine three months after the RhIg.[1]
        - Women who receive RhIg and are non-immune to varicella should receive varicella vaccine three months after the RhIg.[1]
        - If there is a risk of exposure to rubella or varicella disease; or pregnancy in the immediate post-partum period (3 months)[1], the respective vaccine should be administered as soon as possible after delivery and then repeated at the appropriate interval.

Guidelines for the interval between administration of immune globulin preparations or blood products and measles-mumps-rubella (MMR), measles-mumps-rubella-varicella (MMRV) or varicella (VZ) vaccine to maximize immunization effectiveness[1]

Immune globulin or blood product	Dose, route	Interval between receipt of Ig or blood product and subsequent administration of MMR, MMRV or VZ vaccine
Standard immune globulin (human)		
Immune globulin (Ig)	0.02 - 0.06 mL/kg, IM	3 months
	0.25 mL/kg, IM	5 months
	0.50 mL/kg, IM	6 months
Intravenous immune globulin (IVIg)	300 - 400 mg/kg, IV	8 months
	1,000 mg/kg, IV	10 months
	2,000 mg/kg, IV	11 months
Blood transfusion products		
Plasma and platelet products	10 mL/kg, IV	7 months
Whole blood	10 mL/kg, IV	6 months
Packed red blood cells	10 mL/kg, IV	5 months
Reconstituted red blood cells	10 mL/kg, IV	3 months
Washed red blood cells	10 mL/kg, IV	0
Specific immune globulin (human)		
Cytomegalovirus immune globulin (CMVIg)	150 mg/kg, IV	6 months
Hepatitis B immune globulin (HBIg)	0.06 mL/kg, IM	3 months
Rabies immune globulin (RabIg)	20 IU/kg, IM	4 months
Rh immune globulin (RhIg)	300 mcg, IM	3 months
Tetanus immune globulin (TIg)	250 units, IM	3 months
Varicella immune globulin (VarIg)	125 IU/10 kg, IM	5 months
Specific immune globulin (humanized monoclonal antibody)		
Respiratory syncytial virus monoclonal antibody (palivizumab) (RSVAb)	15 mg/kg/4 weeks, IM	0

References

1. National Advisory Committee on Immunization. Canadian Immunization Guide (Evergreen ed.) [Internet]. Ottawa, ON: Public Health Agency of Canada. 2016. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-8-herpes-zoster-(shingles)-vaccine.html#a9.

2. Alberta Health. Adverse Events Following Immunization (AEFI) Policy for Alberta Immunization Providers. 2023.

3. Alberta Health. Active Surveillance and Reporting of Adverse Events Following COVID-19 Immunization. 2022.

4. American Academy of Pediatrics. Red Book: 2021-2024 Report of the Committee on Infectious Diseases (32nd ed.). Elk Grove Village, IL. 2015.

5. Centers for Disease Control and Prevention. General Best Practice Guidelines for Immunization [Internet]. Vaccine Recommendations and Guidelines of the Advisory Committee on Immunization Practices (ACIP). 2023 [cited 2024 Mar 28]. Available from: https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.

6. Centers for Disease Control and Prevention. Pink Book: General Recommendations on Immunization [Internet]. Epidemiology and Prevention of Vaccine-Preventable Diseases 14th ed. 2021 [cited 2024 Mar 28]. Available from: https://www.cdc.gov/vaccines/pubs/pinkbook/genrec.html.

7. Alberta Health. Health and Wellness Promotion. Personal communication and consultation with Canadian Blood Services. 2018.

