

Measles, Mumps, Rubella and Measles, Mumps, Rubella and Varicella Vaccines

April 17, 2024



1



Reminder:

This videoconference/webinar
will be recorded.

2

Acknowledgement

The FNIHB Alberta Region CDC Team has created this training by using Alberta Health and Alberta Health Services documents.



3

Why We're Here Today

- Canada is seeing an increase in measles activity compared to 2023.
 - 48 cases of measles have been reported in Canada in 2024.
 - As of March 30, 2024, there were 44 active-cases of measles in Canada.
 - In Canada, 10 new cases of measles were reported between March 24 – 30, 2024. (9 Quebec, 1 Ontario)
- People who have not had measles disease or who have not been vaccinated are at risk of infection.
- Complications of measles disease occurs in about 10% of measles cases.
- A single dose of measles-containing vaccine given at 12 or 15 months of age is estimated to have an efficacy of 85% to 95%, with efficacy in children of almost 100% with a second dose.
- Due to the high infectivity of measles, at least 95% of the population needs to be immunized to develop herd immunity.
- It is important to have as many people as possible up to date on measles-containing immunizations to reduce the number of individuals susceptible to measles.



4

Exemption to Immunization Certificate

- Typically, HCPs must hold an immunization certificate to provide measles-containing vaccines to individuals.
- The FNIHB *Mandatory Immunization Certification and Re-certification Program* identifies several scenarios when HCPs may be EXEMPT from the Immunization Certification Program.
- HCPs can administer specific immunizations during a public health emergency (e.g., a pandemic, disease outbreak, etc.) once they complete vaccine-specific training approved by the MOH and/or CDC Nurse Manager.
- Due to the increased number of cases in Canada, the FNIHB MOHs have approved all HCP to administer measles-containing vaccines to decrease the number of individuals susceptible to measles.
- Attending/viewing this training and the reviewing applicable documents, will allow HCP without an immunization certificate to provide measles-containing vaccine until notification of ending the exemption.



5

FNIHB Mandatory Immunization Certification and Re-certification Program Policy

- 4.1. Authorized Immunization Providers
- 4.1.1 Routine immunizations shall be administered by a HCP who:
- Is a regulated member of a health profession's body under the Alberta Health Professions Act;
 - **Practices within their scope;**
 - **Adheres to the Standards of Practice outlined by their regulatory body;** and
 - Adheres to FNIHB-AB Policies, Procedures, and Guidelines.
- 4.3.3 HCPs must understand their own fitness to practice when performing authorized restricted activities and limit practice activities to those:
- They are **competent in** and certified to perform;
 - That are within their scope of practice;
 - That adhere to the Standards of Practice outlined by their professional regulatory body;
 - That involve publicly-funded vaccines within the Alberta Immunization Program.



6

FNIHB Mandatory Immunization Certification and Re-certification Program Policy

4.1.2 **Registered Nurses (RNs)** and **Nurse Practitioners (NPs)** may administer vaccines according to Section 15(1)(f) of the Alberta Health Professions Act provided they:

- Complete the provider-based Immunization Certification Program (see Section 4.2); and
 - Adhere to FNIHB policy and protocol, as well as the standards of practice outlined by their **regulatory body**, for providing authorized restricted activities.
-
- Nursing Students who are under the supervision of a Registered Nurse that has a valid Immunization Certificate, do not require certification as per the CRNA Standards of Supervision (supervision-standards-2022.pdf (nurses.ab.ca))



7

FNIHB Mandatory Immunization Certification and Re-certification Program Policy

4.1.3 **Licensed Practical Nurses (LPNs)** may administer vaccines according to Section 13(1)(c) of the Alberta Health Professions Act provided they:

- Complete the provider-based Immunization Certification Program (see Section 4.2);
- Adhere to FNIHB policy and protocol, as well as the **standards of practice outlined by their regulatory body**, for providing authorized restricted activities; and
- Administer vaccine to **populations that are authorized under their profession's scope**



8

FNIHB Mandatory Immunization Certification and Re-certification Program Policy

4.1.4 **Primary Care Paramedics (PCPs)** and **Advanced Care Paramedics (ACPs)** may administer vaccines according to Section 16(2)(f) of the Alberta Health Professions Act provided they:

- Complete the provider-based Immunization Certification Program (see section 4.3.2);
- Adhere to FNIHB policy and protocol, as well as the standards of practice outlined by their **regulatory body**, for providing authorized restricted activities; and
- **Administer vaccine to populations that are authorized under their profession's scope**
- **Have a certified preceptor available on site to provide guidance or direction as required**



9

Today's Agenda

- Review measles disease
- Short review of mumps, rubella, and varicella diseases
 - (because they are also included in the vaccine)
- Review information on the AHS biological pages for measles-containing vaccines – MMR and MMR-Var
- Vaccine storage and handling principles
- Informed consent
- Fit to immunize
- 7 rights of immunization
- Anaphylaxis

There's a lot of information. We'll make sure we point you to the resources so you can review them following this session.



10

Measles Review

- Measles is a virus that spreads easily through the air when someone who has measles coughs, sneezes, yells, sings, or breathes.
- Measles is sometimes called rubeola or red measles.
- Symptoms can appear 7 to 21 days after being infected with the measles virus. People infected with measles can spread it to others before they have symptoms.
- The risk of an outbreak is highest when:
 - a person who's unvaccinated or non-immune travels to a country where measles is circulating and gets infected
 - there are a lot of people who are unvaccinated or non-immune clustered together in particular regions or communities
- This can lead to a measles outbreak.

Measles Review

- The incubation period is about 10 days from exposure to the onset of prodromal symptoms (ranging from 7 to 18 days).
- The interval from infection to appearance of rash averages 14 days, but the rash can appear as late as 19 to 21 days from infection.
- Symptoms can appear 7 to 21 days after being infected with the measles virus. People infected with measles can spread it to others before they have symptoms.
- Initial symptoms include Fever, cough, runny nose, and red watery eyes
- Small, white spots may appear inside the mouth and throat 2 to 3 days after symptoms begin.
- About 3 to 7 days after symptoms begin, a rash that looks like small red spots:
 - develops on the face
 - spreads down the body, arms and legs
- The rash can last 4 to 7 days.
- Most people recover from measles within 2 or 3 weeks.

Measles Review

- Measles is one of the most highly communicable infectious diseases with greater than a 90% secondary attack rate among people who are susceptible. The measles virus spreads through the air when a person who is infected breathes, coughs, sneezes or talks. It may also spread through direct contact with fomites or secretions from the nose and throat of a person who is infected.
- **Airborne precautions** should be used for patients with confirmed or suspected measles.
- People with confirmed measles are infectious from 1 day before the beginning of the prodromal period (usually about 4 days before rash onset) to 4 days after the appearance of rash. The measles virus can persist in the air or on surfaces for up to 2 hours after a person who is infected has left the space. People who recover from measles have lifelong immunity to the disease.

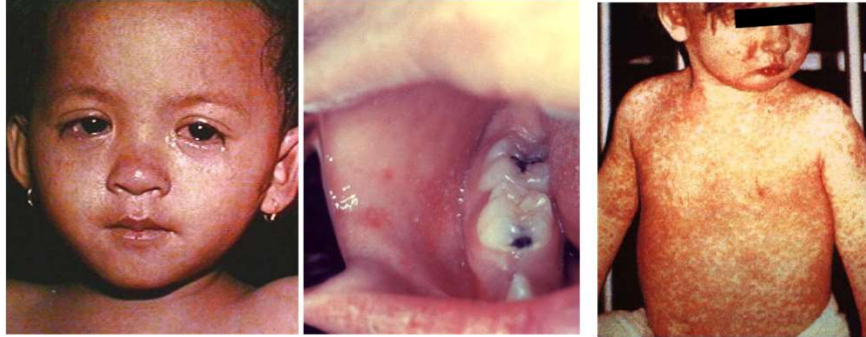
Measles Review

- **Measles can be dangerous because:**
 - One in 10 people with measles will get middle ear or lung infections.
 - One in 1,000 people with measles will get encephalitis (swelling of the brain), which can lead to seizures, deafness, or brain damage.
 - One to three of every 1,000 cases of measles will result in death.
- Before vaccinations, about 10,000 to 90,000 people living in Canada were infected with measles every year.

Treatment

- There is no specific antiviral treatment for measles infection. Medical management is supportive and aimed at symptom relief and management of complications.

Measles Review: Measles Rash and Spots in Mouth



15

Mumps Review

What is mumps?

- Mumps is a virus that spreads by coughing, sneezing, or having contact with saliva (such as kissing or sharing toys).
- You can have no symptoms but still spread mumps.
- It can cause:
 - a fever
 - a headache
 - swelling of the glands around your jaw
 - swelling of the testicles or ovaries
 - deafness
 - encephalitis
 - meningitis (infection of the fluid and lining that cover the brain and spinal cord)

16

Rubella Review

What is Rubella?

- Rubella is a virus that spreads by coughing or sneezing.
- It is usually mild.
- It can cause:
 - a fever
 - a sore throat
 - swollen neck glands
 - a rash with red, raised bumps
 - painful, swollen joints
 - encephalitis
 - a bleeding disorder
- If you get rubella while you are pregnant, it can cause loss of a baby during pregnancy (miscarriage or stillbirth) or the baby may be born with disabilities.



17

Chicken Pox Review

- Varicella is a virus that can cause a fever and an itchy rash that looks like small water-filled blisters.
- It spreads easily through the air by coughing, sneezing, or by touching open blisters.
- It is usually mild, but can be more serious in newborns, adults, and people with weak immune systems.
- People who get varicella can have:
 - skin infections
 - pneumonia
 - blood infections
 - other deadly infections



18

Today's Vaccine Review

- Review information for measles-containing vaccines.
 - Measles, Mumps, & Rubella (MMR)
 - Measles, Mumps, Rubella & Varicella (MMR-Var)
- A review of each of the biological pages, including:
 - Indications for provincially funded vaccine
 - Schedule
 - Dose and route
 - Contraindications and precautions
 - Possible reactions
 - Administration with other products
 - Storage



AHS Biological Pages

- There are biological pages posted on the AHS website for the two vaccines that protect against measles.
 - **Measles, Mumps, and Rubella (MMR):**
<https://www.albertahealthservices.ca/assets/info/hp/cdc/if-hp-cdc-mmr-vac-bio-pg-07-270.pdf>
 - **Measles Mumps, Rubella, and Varicella (MMR-Var):**
<https://www.albertahealthservices.ca/assets/info/hp/cdc/if-hp-cdc-mmrvar-vac-bio-pg-07-271.pdf>

These are the documents that are used when providing the immunizations. Always use the biological pages posted on the AHS website for complete and current information.

MMR and MMR-Var Vaccine Review

- The MMR vaccine protects against measles, mumps and rubella.
 - The efficacy of a single dose of measles vaccine given at 12 or 15 months of age is estimated to be 85% to 95%. With a second dose, efficacy is almost 100%.
 - Mumps vaccine effectiveness has been estimated at 62% to 91% for 1 dose and 76% to 95% for 2 doses.
 - Rubella: over 97% of individuals develop immunity after 1 dose of rubella vaccine.
- The MMR-Var vaccine also protects against varicella.
 - The efficacy of varicella vaccines in children is estimated to be 94.4% following a single dose and 98.3% following a second dose.

[Canadian Immunization Guidelines - Part 4](#)



Vaccine Information

- Licensed for use in Canada
- Biological classification: **Live attenuated**
- The manufacturers for the MMR and MMR-Var Vaccine are Merck Canada Inc. and GlaxoSmithKline Inc.
- **Vaccine code:** MMR and MMR-Var
- **Antigen code(s):**
 - Measles – MEA
 - Mumps – MU
 - Rubella – RUB
 - Varicella – VZ

Vaccine Storage and Handling Principles

- Vaccine management refers to the process of handling vaccines from the time they are manufactured until they are administered
- The following standards set out the requirements and provide direction to all community health staff handling provincially funded vaccines. These ensure vaccine efficacy and client safety is protected and providers are knowledgeable regarding vaccine storage, handling and timely reporting of cold chain excursions.
- Nurses who do not hold an immunization certificate must review the following documents posted on OneHealth
 - ISC – [FNIHB AB Region: Vaccine Management Standards](#) (February 2023)
 - ISC - [Vaccine Storage and Handling Checklist](#) (August 2022)
- **Review vaccine management with an experienced nurse in your community**
- If you have additional questions about vaccine storage and handling, cold chain excursions, reach out **Stephanie Amoah** (587-335-9844) or **Melissa Evans** (249-313-0306).



23

Vaccine Storage and Handling Principles

Every immunizer must:

- Understand cold chain excursions (breaks) and the implications of them
- Identify the key staff members at the clinic responsible for vaccine management
- **Understand the specific vaccine storage and handling recommendations for each product**
- **MAINTAIN COLD CHAIN OF VACCINE**
- Understand how to monitor and interpret Temptale, min/max thermometer readings
- Understand the actions required if a cold chain excursion occurs



Slide used with permission from AHS.

24

MMR and MMR-Var Vaccine Storage

- Store at +2° C to +8° C in its original box
 - Vaccine fridge
 - Vaccine bag
- Must be protected from light
- Do not freeze
- Do not use beyond the labeled expiry date
- Diluent may be stored at room temperature
- Reconstituted vaccine should be used as soon as possible. Discard if not used within 30 minutes (MMR-Var ProQuad®).



Licensed Use of Vaccine(s)

MMR: Priorix® and M-M-R® II

- All individuals 12 months of age and older.
- Off-license use for infants 6 months up to and including 11 months of age who are:
 - Travelling to or through areas where measles is circulating
 - Contact of a measles case
 - Pre solid organ transplant



Licensed Use of Vaccine(s)

MMR-Var: Priorix-Tetra®

- Children 9 months of age up to and including 12 years of age.
- Note: In Alberta, MMR-Var is not used for children less than 12 months of age, as they may not respond sufficiently to the measles component of the vaccine due to persistence of maternal antibody.

MMR-Var: ProQuad®

- Children 12 months of age up to and including 12 years of age.

Vaccine Administration: Dose and Route

Needle size & length:

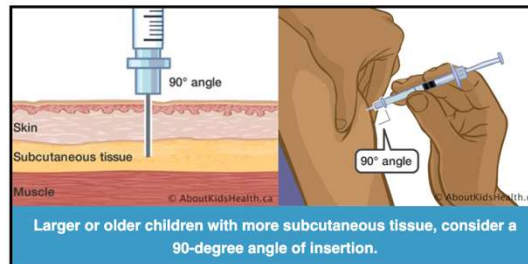
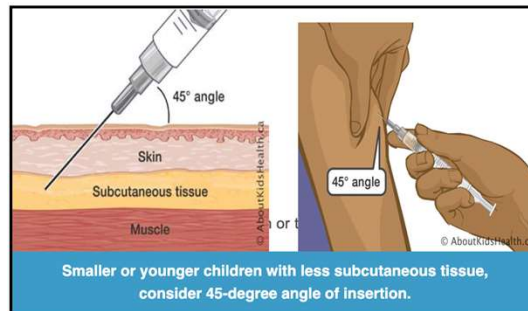
25 gauge, 5/8" needle

Route:

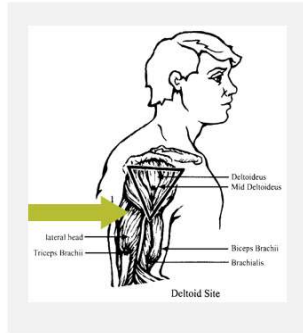
Subcutaneous (SC) injection under the skin, not in a muscle. Typically, into the upper triceps area of the arm.

Dose: 0.5ml

Note: Withdraw the entire contents of the diluent and inject into the vial containing the powder. Once reconstituted withdraw the entire contents of the vial and inject the entire volume.



Vaccine Administration



Children and adults: in the subcutaneous tissue of the upper triceps area of the arm

- Fully expose limb
- Limb alignment



FIGURE 3. Intramuscular/subcutaneous site of administration: anterolateral thigh



Source: Adapted from Minnesota Department of Health. Photo Source: IPSM

Less than 12 months of age: subcutaneous tissue of the anterolateral thigh

Vaccine Administration: Commitment to Comfort

Healthcare workers should be committed to making the experience as comfortable as possible. A commitment to comfort promotes comfort by helping lessen pain and distress that may be experienced during immunizations. *Some tips and tricks:*

Infants

- swaddling and facilitated tucking
- parental presence and snuggles
- breastfeeding



Children

- Position comfortably (bear hug, side sitting, etc.)
- Use distraction techniques (story, singing, etc.)
- Use simple and positive language



AHS Commitment to Comfort:

<https://www.albertahealthservices.ca/ctc/page17560.aspx>

Immunization Doses

- **An individual's immunization chart must be reviewed prior to administering measles containing vaccines:**
 - Review the chart to see if the individual has received previous doses of measles-containing vaccines
 - Identify when the last dose of measles-containing vaccine was given
 - Review the biological page to determine how many doses of measles-containing vaccine the individual requires
 - The number of doses on the biological page indicates the **total number** of doses required.
 - If there is one dose on the immunization chart, and the biological page indicates they need two, then one more appropriately spaced measles vaccine is to be given
 - If there are two doses on the immunization chart, and the biological page indicates they need two, the individual does not require any more doses. They are up to date.

Indications for Use

- The AHS biological page now has a section called *Areas where measles is circulating in Canada*.
- The section is right at the top of the biological page.
- It indicates the areas in Canada where there is known measles disease.
- This section is used to determine whether an individual is eligible for the measles vaccine due to travel in Canada.
- Currently, Montreal and Toronto are listed.

Indications for Use – Pre-exposure

Age Group	Dose & Scheduling	Notes
<p>Infants 6 months of age up to and including 11 months of age:</p> <ul style="list-style-type: none"> Travelling to or through areas where measles is circulating in Canada or any other country outside of Canada candidates for solid organ transplant (SOT) 	<p>MMR Vaccine 1 Dose SC</p>	<ul style="list-style-type: none"> To ensure long term protection, two additional doses of measles-containing vaccine must be administered beginning at 12 months of age with the appropriate interval between doses.

Reminder: For complete and current information, always use the biological pages posted on the AHS website.

Indications for Use – Pre-exposure

Age Group	Dose & Scheduling	Notes
<p>Healthy children</p> <ul style="list-style-type: none"> 12 months of age up to including 12 years of age when <i>varicella vaccine is also indicated</i> 	<p>MMR-Var Vaccine 2 Doses SC</p> <ul style="list-style-type: none"> Dose 1: 12 months of age Dose 2: 18 months of age (previously given at 4 – 6 years of age, with preschool boosters) 	<ul style="list-style-type: none"> If off-schedule, there should be a minimum 3 months between each MMR-Var dose. Children travelling to or through areas where measles is circulating in Canada (Montreal and Toronto) and all countries outside of Canada should have two doses of measles containing vaccine with the appropriate minimum interval between doses (see biological page for spacing for MMR and MMR-Var vaccines). The second dose of measles-containing vaccine given as MMR vaccine alone or MMR-Var can be given prior to 18 months of age using the recommended interval between doses.

Reminder: For complete and current information, always use the biological pages posted on the AHS website.

Indications for Use – Pre-exposure

Age Group	Dose & Scheduling	Notes
Healthy children <ul style="list-style-type: none"> • 12 months of age up to and including 12 years of age when varicella vaccine is not indicated • children 13 years of age up to including 17 years of age 	<p style="text-align: center;">MMR Vaccine 2 Doses SC</p> <ul style="list-style-type: none"> • <i>Dose 1:</i> 12 months of age • <i>Dose 2:</i> 18 months of age (previously given at 4 – 6 years of age, with preschool boosters) • If child is off schedule or rapid protection is required (travel or post exposure), minimum spacing between doses is 4 weeks. 	<ul style="list-style-type: none"> • Review varicella biological page to confirm varicella vaccine is not indicated • Children travelling to or through areas where measles is circulating in Canada (Montreal and Toronto) and all countries outside of Canada should have two doses of measles containing vaccine with the appropriate minimum interval between doses (see biological page for spacing for MMR and MMR-Var vaccines). • The second dose of measles-containing vaccine given can be given prior to 18 months of age using the recommended interval between doses. • MMR-Var vaccine <u>cannot</u> be used for individuals 13 years of age and older, MMR vaccine must be used.

35

Indications for Use – Pre-exposure

Age Group	Notes
Individuals 18 years of age and older born <u>after</u> 1970	<p>Protected from measles if they have:</p> <ul style="list-style-type: none"> • history of 2 valid doses of measles-containing vaccine, OR • history of laboratory confirmed measles disease, OR • serological evidence of measles immunity (measles IgG positive). <ul style="list-style-type: none"> • When required, the MMR vaccine is used for these individuals, with a minimum of 4 weeks between doses.

36

Indications for Use – Pre-exposure

Age Group	Notes
Health care workers (regardless of year of birth):	<p>Protected from measles if they have:</p> <ul style="list-style-type: none"> • history of 2 valid doses of measles-containing vaccine, OR • history of laboratory confirmed measles disease, OR • serological evidence of measles immunity (measles IgG positive). <ul style="list-style-type: none"> • When required, the MMR vaccine is used for these individuals, with a minimum of 4 weeks between doses.

Indications for Use – Pre-exposure

Age Group	Notes
Post-secondary students born before 1970	<p>Protected from measles if they have:</p> <ul style="list-style-type: none"> • history of 1 valid dose of measles-containing vaccine, OR • history of laboratory confirmed measles disease, OR • serological evidence of measles immunity (measles IgG positive). <ul style="list-style-type: none"> • When required, the MMR vaccine is used for these individuals.

Indications for Use – Pre-exposure

Age Group	Notes
<p>Individuals born <u>before</u> 1970 travelling to or through areas where measles is circulating in Canada (Montreal and Toronto) and all countries outside of Canada:</p>	<p>Protected from measles if they have:</p> <ul style="list-style-type: none"> • history of 1 valid dose of measles-containing vaccine, OR • history of laboratory confirmed measles disease, OR • serological evidence of measles immunity (measles IgG positive). <ul style="list-style-type: none"> • When required, the MMR vaccine is used for these individuals.

Indications for Use – Pre-exposure

Age Group	Notes
<p>Individuals born <u>before</u> 1970 who are <u>not</u> a:</p> <ul style="list-style-type: none"> • healthcare worker, • post-secondary student, or • traveling to or through areas where measles is circulating in Canada (Montreal and Toronto) and all countries outside of Canada 	<ul style="list-style-type: none"> • From a population perspective, these individuals are generally presumed to have acquired natural immunity to measles. • Do not require measles vaccine. • Serology is not indicated. • Note: individuals born in 1957 or later require 1 dose MMR for Rubella if they do not have lab confirmed rubella disease or immunity.

Spacing Considerations

This chart appears in the MMR and MMR-Var biological pages.

Spacing Considerations:

Recommended Intervals for MMR and Varicella Containing Vaccines			
Previous Vaccine Administered	Recommended Interval to Next Dose		
	MMR-Var	MMR ¹	Varicella
MMR-Var	3 months	6 weeks	3 months
MMR ¹	6 weeks	4 weeks	4 weeks
Varicella	3 months	4 weeks	6 weeks or 3 months ²

- ¹ For all HSCT recipients there must be a minimum of 3 months separating 2 doses of MMR vaccine. See *Standard for Immunization of Transplant Candidates and Recipients*.
- ² An interval of 3 months between doses of varicella containing vaccines is recommended for individuals under 13 years of age and 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 three months between doses.



Reminder: For complete and current information, always use the biological pages posted on the AHS website.

Scheduling Considerations

Notes:

- Live attenuated influenza vaccine (LAIV/QLAIV) 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.
- If live vaccine was inadvertently administered at less than the routine intervals outlined above, the dose can be considered valid, and vaccine would not need to be repeated if there is a minimum interval of at least 4 weeks.
- Children who have presented for their 18-month immunization prior to January 1, 2021, will be offered their second dose of measles-containing vaccine when they present for the preschool booster.
- Children who receive their first dose of varicella-containing vaccine and at any point subsequently develop laboratory-confirmed vaccine modified varicella disease do not require a second dose of varicella-containing vaccine.



Reminder: For complete and current information, always use the biological pages posted on the AHS website.

Scheduling Considerations

Continued from previous:

- With the exception of Yellow Fever vaccine, MMR can be administered simultaneously with other live vaccines or separated by an interval of at least 4 weeks (See Administration with Other Products section for additional information for MMR and Yellow Fever vaccine spacing).
- Any dose of MMR or MMR-Var vaccine administered before one year of age must be repeated on or after 12 months of age and separated by the appropriate interval.
- Parents who refuse the combined MMR-Var vaccine and wish to have the separate MMR and univalent varicella vaccine may be accommodated

Indications for Use - Measles

POST EXPOSURE – MOH Direction

Measles:

- Susceptible contacts of a measles case should receive either MMR or immune globulin depending upon the time-lapse from exposure, age and health status.
 - Susceptible contacts 12 months of age and older should receive measles-containing vaccine unless vaccine is contraindicated.
 - The vaccine should be administered within 72 hours of exposure and should not be delayed pending serology results.
 - Children younger than 18 months of age who have received one dose of measles containing vaccine (considered up to date) should receive a second dose of measles containing vaccine ensuring the recommended interval spacing between the vaccine doses.

Susceptible = does not have protection from measles

Indications for Use - Measles

POST EXPOSURE – MOH Direction

- If measles-containing vaccine is contraindicated or if more than 72 hours since exposure have elapsed, Immune Globulin (Ig) may be indicated for **susceptible** individuals. See *Immune Globulin Biological Page #07.250*.
- If measles-containing vaccine is administered more than 72 hours after exposure, it may not provide protection against the current exposure but would offer protection against subsequent exposures

Note:

- As an outbreak control strategy during a measles outbreak, the Medical Officer of Health may recommend MMR vaccine for children 6-11 months of age inclusive

Serology - Measles

- **Measles pre-immunization serology (measles IgG):**
- Serology prior to measles immunization is not routinely indicated.
- If previously drawn, positive measles IgG serology results or laboratory confirmed measles disease can be accepted as immunity to measles disease.
- Measles IgG serology results may be used in specific situations to determine immunity to measles (health care workers, post-secondary students, high-risk occupational programs, transplant candidates and recipients)

Serology - Measles

- **Measles post-immunization serology (measles IgG):**
 - Serology after measles immunization is not routinely indicated.
 - Sometimes measles IgM serology (alone or in addition to measles IgG serology) is inadvertently drawn when an individual present to their family physician with an expected reaction (measles-like rash) following immunization with measles containing vaccine. Although measles IgM can indicate evidence of acute disease it can also be present following recent immunization.
 - Assessment of positive measles IgM results should include checking for recent immunization with measles containing vaccine. In the event of a recent positive measles IgM serology result immediately follow-up with the CDC nurse for further advice and direction.

Serology - Mumps

- **Mumps pre-immunization or mumps post-immunization serology (mumps IgG):**
 - Not routinely indicated.
- **Rubella pre-immunization serology (rubella IgG):**
 - Not routinely indicated.
 - If previously drawn, a history of documented positive rubella IgG serology can be accepted as immunity to rubella disease.
 - Rubella IgG serology results may be used in other specific situations to determine immunity to rubella (prenatal, health care workers, post-secondary health care student, students in high-risk occupational programs, transplant candidates and recipients)
- **Rubella post-immunization serology (rubella IgG):**
 - Not routinely recommended.
 - If an individual has a positive rubella IgG, or a history of age-appropriate rubella immunization no further serological testing is indicated.

Specific Travel Indications & Recommendations for Measles

Individuals travelling to areas where measles is circulating in Canada and all countries outside of Canada.

- **Infants: 6 months up to and including 11 months of age**
 - One dose of MMR vaccine.
 - Note: Two additional doses of measles-containing vaccine should be administered as per routine schedule at 12 months of age and older respecting recommended intervals.
- **Children: 12 months up to and including 17 years of age**
 - Dose 1: Day 0
 - Dose 2: four weeks after dose 1
 - Note: When both MMR vaccine and varicella vaccine are indicated for children 12 months up to and including 12 years of age, MMR-Varicella combined vaccine should be considered.
- **Adults (18 years of age and older)**
 - Adults born in 1970 or later:
 - Two life-time doses with at least four weeks between doses.
 - **Adults born prior to 1970:**
 - Adults born prior to 1970 without a documented history of measles-containing vaccine, history of laboratory-confirmed measles disease or laboratory evidence of measles immunity should receive one dose of measles-containing vaccine.

MMR and MMR-Var Possible Reactions

Common:

- Redness, swelling and tenderness at injection site
- Burning and/or stinging at injection site for a short duration immediately following injection
- Fever, rash, and/or measles-like rash appearing between the 6th and 23rd day following immunization
 - **Note:** Following the administration of the first dose of MMR-Var higher incidences of fever (approximately 1.5-fold) were observed when compared to the concomitant administration of MMR and Varicella vaccines at separate injection sites.
- Irritability
- Arthralgia/arthritis 1-3 weeks following immunization (more common in post pubescent females)
- Diarrhea, vomiting
- Irritability

MMR and MMR-Var Possible Reactions

Uncommon:

- Induration, warmth, mass/lump at injection site
- Lymphadenopathy
- Nervousness, abnormal crying, insomnia
- Conjunctivitis
- Bronchitis, wheezing
- Parotid gland enlargement
- Anorexia
- Gastroenteritis, diarrhea, vomiting
- Ear infection, nasopharyngitis, cough, rhinorrhea
- Urticaria
- Lethargy, malaise, fatigue, insomnia, somnolence
- Febrile convulsions



Refer to the product monograph for more detailed information.

51

MMR and MMR-Var Possible Reactions

Rare:

- Anaphylaxis
- Cough, bronchitis, wheezing
- Arthritis, arthralgia 1-3 weeks following immunization
- Ataxia
- Headache
- Conjunctivitis, tearing, visual discomfort
- Flushing
- As with any immunization, unexpected or unusual side effects can occur. Refer to the product monograph for more detailed information.



Refer to the product monograph for more detailed information.

52

Pregnancy and Lactation

Pregnancy

- Live vaccines, including MMR and MMR-Var, are **contraindicated in pregnant individuals**.
- Individuals of child-bearing potential should be advised to avoid pregnancy for 1 month following immunization with a measles containing vaccine.

Lactation

- **MMR:** Can be safely administered to eligible breastfeeding women.
- **MMR-Var:** Adequate human data on the use of MMR-Var during breastfeeding is not available. Susceptible individuals who are breastfeeding should be immunized with a varicella containing vaccine according to an age-appropriate schedule.



MMR - Vaccine Contraindications

- Known hypersensitivity to any component of the vaccine
- Anaphylactic or other allergic reaction to previous dose of vaccine containing similar components
- Pregnancy
- Impaired immune function due to HIV, AIDS, HSCT, SOT, cellular immune deficiencies. (See biological page for specifics)
- Persons receiving immunoablative or immunosuppressive therapy including high dose corticosteroids. (See biological page for specifics)
- Immunocompromised (See biological page for specifics)

MMR - Vaccine Contraindications

Continued from previous:

- Agammaglobulinaemia or hypogammaglobulinaemia.
- Family history of congenital or hereditary immunodeficiency, unless the immune competence of the potential vaccine recipient is demonstrated.
- Immunosuppressive therapy (including high dose corticosteroids).
- Active untreated tuberculosis. See Precautions section for further detail.
- Solid organ transplant recipients.
- Recent (within the previous 11 months) administration of immune globulins and blood products.
- Administration of another live vaccine within the past 1-3 months. See spacing considerations section.

MMR-Var Vaccine Contraindications

- **Known hypersensitivity to any component of the vaccine.**
- Anaphylactic or other allergic reaction to previous dose of vaccine containing similar components.
- Pregnancy.
- Impaired immune functioning including those with primary or secondary immunodeficiencies. This could include but is not limited to:
 - Congenital immunodeficiency states
 - Persons who are immunocompromised
 - Persons receiving immunoablative or immunosuppressive therapy, including high dose corticosteroids

(See biological page for specifics)

MMR-Var Vaccine Contraindications

Continued from previous:

- HIV-infected children
- Family history of congenital or hereditary immunodeficiency, unless the immune competence of the potential vaccine recipient is demonstrated.
- Active untreated tuberculosis.
- Immune globulins or blood product received within the past 11 months.
- Administration of another live vaccine within the past 1-3 months.

See biological page for specifics

MMR Vaccine Precautions

- Egg allergy, including anaphylaxis, is not a contraindication to immunization with MMR vaccine as the amount of egg protein found in the vaccine is not felt to be enough to cause an allergic reaction. Observation for 30 minutes post immunization is recommended for clients who have experienced anaphylaxis to eggs.
- The use of MMR vaccine in individuals who suffered thrombocytopenia after a first dose of live measles, mumps, and rubella vaccines should be carefully evaluated in terms of risk-benefit. Should be referred to their physician for serology to assess immunity to measles, mumps and rubella and to determine the need for vaccine. A second dose of vaccine should only be given if non-immune and after consultation with zone MOH/designate.
- Immunization with a measles-containing vaccine can suppress tuberculin reactivity.
- Measles-containing vaccines are contraindicated in individuals with active, untreated tuberculosis as a precautionary measure. Tuberculosis may be exacerbated by natural measles infection, but there is no evidence that measles vaccine has the same effect.

MMR-Var Vaccine Precautions

- There is an increased risk of fever and febrile seizures 5 – 12 days after the first dose of **MMR-Var** vaccine in children 12-47 months of age as compared to MMR and varicella vaccine given separately. However, this risk is highest in children ages 12-23 months.
- Research suggests that children with a personal or family (i.e. sibling or parent) history of seizures of any etiology including febrile or epilepsy are at increased risk of febrile seizures. Therefore, the following information should be discussed with parents/caregivers:
 - The risk for fever and potential for febrile seizures is higher with the first dose (given between 12-47 months) of combined MMR-Var vaccine than MMR and varicella vaccines given separately.
 - MMR and varicella vaccines can be offered separately.
 - If the parent/caregiver decides to proceed with combined MMR-Var vaccine they should be counselled to monitor the child for fever.
 - There is no indication of an increased risk after the second dose of MMR-Var.

MMR-Var Vaccine Precautions

Continued from previous:

- Egg allergy, including anaphylaxis, is not a contraindication to immunization with MMR-Var vaccine as the amount of egg protein found in the vaccine is not felt to be enough to cause an allergic reaction. Observation for 30 minutes post immunization is recommended for clients who have experienced anaphylaxis to eggs.
- The use of MMR-Var in children who suffered thrombocytopenia after a first dose of live measles, mumps, and rubella vaccines should be carefully evaluated in terms of risk-benefit. Individuals should be referred to their physician for serology to assess immunity to measles, mumps and rubella and to determine the need for vaccine. A second dose of vaccine should only be given if non-immune and after consultation with zone MOH/designate.
- Avoid the use of salicylates for 6 weeks after vaccination if possible. However, children on long term salicylate therapy are at a higher risk of Reye syndrome following wild varicella and should be considered for immunization with close subsequent monitoring. Medical consultation is recommended before proceeding with immunization in children on salicylate therapy.

MMR-Var Vaccine Precautions

Continued from previous:

- Individuals on long term systemic antiviral therapy (e.g., acyclovir, valacyclovir or famciclovir) should discontinue their antivirals at least 24 hours before administration of vaccine and for up to 14 days after administration. Consult with individual's physician before immunizing.
- Immunization with a measles-containing vaccine can suppress tuberculin reactivity resulting in false negative results. If tuberculin skin testing is required, it should be done on the same day as immunization with a measles-containing vaccine or delayed for at least four weeks after immunization. See *Tubersol Biological Page*.
- Measles-containing vaccines are contraindicated in individuals with active, untreated tuberculosis as a precautionary measure. Tuberculosis may be exacerbated by natural measles infection, but there is no evidence that measles vaccine has the same effect.
- If a vaccine recipient develops a varicella-like rash, the rash should be covered and direct contact with susceptible high-risk individuals should be avoided for the duration of the rash.
- **Note:** A history of contact dermatitis to neomycin is not a contraindication.

Vaccine Composition

MMR Vaccine - Priorix®:

Each 0.5 mL dose of reconstituted vaccine contains:

- Not less than 103.0 CCID₅₀ of the Schwarz **measles**
- Not less than 103.7 CCID₅₀ of the RIT 4385 **mumps** (derived from the Jeryl Lynn strain)
- Not less than 103.0 CCID₅₀ of the Wistar RA 27/3 **rubella** virus strains
- Amino acids
- Lactose
- Mannitol
- **Neomycin** sulphate
- Sorbitol
- **Trace amounts of egg protein** (measles and mumps viruses grown in chick embryo fibroblast culture)
- Sterile water for injection (diluent)

Vaccine Composition

MMR Vaccine - M-M-R® II:

Each 0.5 mL dose of reconstituted vaccine contains:

- **Measles** virus, Enders' Edmonston strain (live, attenuated) not less than 1,000 CCID50
- **Mumps** virus, Jeryl Lynn® (B level) strain (live attenuated) not less than 5,000 CCID50
- **Rubella** virus, Wistar RA 27/3 strain (live attenuated) not less than 1,000 CCID50
- 14.5 mg sorbitol
- 14.5 mg hydrolyzed **gelatin**
- 3.3 mg medium 199 with Hank's salts
- 3.1 mg sodium phosphate monobasic
- 2.2 mg sodium phosphate dibasic (anhydrous)
- 1.9 mg sucrose
- 0.5 mg sodium bicarbonate
- 0.1 mg minimum essential medium, eagle
- 30 mcg potassium phosphate dibasic (anhydrous)
- 25 mcg **neomycin**
- 20 mcg monosodium L-glutamate monohydrate
- 20 mcg potassium phosphate monobasic
- 3.4 mcg phenol red
- ≤ 0.3 mg recombinant human albumin
- Less than 1 ppm fetal bovine serum
- Propagated in chick embryo cell culture
- Sterile water for injection (diluent)

Vaccine Composition

MMR-Var Vaccine - Priorix-Tetra®:

Each 0.5 mL dose of reconstituted vaccine contains:

- Not less than 10PPP3.0 PPPCCID RRR50RRR of Schwarz **measles** strain
- Not less than 10PPP4.4 PPPCCID RRR50RRR RIT 4385 **mumps** strain (derived from Jeryl Lynn strain)
- Not less than 10PPP3.0 PPPCCID RRR50RRR of Wistar RA 27/3 **rubella** virus strain
- Not less than 10PPP3.3 PPPOKA **varicella** virus strain
- Amino acids for injection
- **Lactose**
- Mannitol
- **Neomycin** sulphate
- Sorbitol
- **Trace amounts of egg protein** (measles and mumps viruses grown in chick embryo cells)
- Sterile water for injection (diluent)

Vaccine Composition

MMR-Var Vaccine - ProQuad®:

Each 0.5 mL dose of reconstituted vaccine contains:

- Not less than 3.00 log₁₀ TCID₅₀ **measles** virus (derived from Ender's attenuated Edmonston strain)
- Not less than 4.30 log₁₀ TCID₅₀ **mumps** virus (Jeryl Lynn [B level] strain)
- Not less than 3.00 log₁₀ TCID₅₀ **rubella** virus (Wistar RA 27/3 propagated in WI-38 human diploid lung fibroblasts)
- Not less than 3.99 log₁₀ PFU **varicella** virus (Oka/Merck strain propagated in MRC-5 cells)
- Urea (2.5 mg)
- Sodium chloride (2.3 mg)
- Sorbitol (16 mg)
- Monosodium L-glutamate (0.38 mg)
- Sodium phosphate (1.4 mg)
- Recombinant human albumin (0.25 mg)
- Sodium bicarbonate (0.13 mg)
- Potassium phosphate (94 mcg)
- Potassium chloride (58 mcg)
- **Neomycin** (5 mcg)
- Sucrose (no more than 20 mg)
- **Hydrolyzed gelatin** (11 mg)
- Residual components of MRC-5 cells including DNA and protein
- **Measles and mumps viruses propagated in chick embryo cell culture**
- Sterile water for injection (diluent)



65

Blood/Blood Products and Bovine/Porcine Products

Blood/Blood Products:

- Does not contain blood/blood products however the rubella and varicella viruses are grown in MRC-5 human diploid cell culture.
- Human albumin
- Rubella virus propagated in WI-38 human diploid lung fibroblasts.
- Varicella virus propagated in human diploid MRC-5 cells

Bovine/Porcine Products:

- Contains lactose and galactose derived from Bovine milk
- Fetal Bovine serum & Trypsin is used as raw materials during manufacturing process
- Contains less than 1 ppm of fetal bovine serum.
- Contains hydrolyzed gelatin of porcine origin.

Note: Vaccines do not contain latex.



66

Vaccine Interchangeability

- PRIORIX® or M-M-R® II may be used interchangeably provided the appropriate dose and schedule recommended by the manufacturer are used.
- MMR-Var vaccine may be given to susceptible individuals 12 months up to and including 12 years of age who have previously been immunized with another measles, mumps, rubella or varicella containing vaccine and require a second measles, mumps, rubella and varicella vaccine. See schedule section for spacing considerations.

Administration with other products

- See schedule section for recommended intervals between all measles, mumps, rubella and varicella vaccines.
- Except for Yellow Fever vaccine, MMR can be administered simultaneously with other live vaccines or separated by an interval of at least 4 weeks.
- Live attenuated influenza vaccine (LAIV/QLAIV) 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.
- MMR vaccine can be given at the same time as other inactivated and live vaccine using a separate needle and syringe for each vaccine. The same limb may be used, if necessary, but different sites on the limb must be chosen.
- **Tuberculin skin tests** should be given either before or at the same time as MMR vaccine; otherwise, the tuberculin skin test should be delayed for 4 weeks following MMR vaccine.

Administration with other products: Continued

- Immune globulins (IG) and antibody-containing blood products cannot be given concurrently with live vaccines and need to be separated by specified time intervals depending upon the dosage and the biological.
 - See *Recommended Schedules Standard - Guidelines for Interval Between Immune Globulin and other Blood Products and Live Vaccines* for spacing considerations.
- If MMR is given to rubella susceptible women less than 3 months from receipt of the Rhlg (RhoGam, Anti-Rho D), serological testing should be done 3 months after the MMR dose to assess the immune response. If MMR is given 3 months or more following Rhlg then serology is not necessary.

Vaccine Appearance

(MMR) Priorix® and (MMR-Var) Priorix®-Tetra:

- Diluent: clear, colorless
- Vaccine prior to administration: whitish to slightly pink colored cake or powder (pellet)
- Reconstituted vaccine: clear peach to fuchsia pink (bright pink) colored solution due to minor variations of its pH. This is normal and does not impair performance of the vaccine.

(MMR) M-M-R® II:

- Diluent: clear, colorless
- Vaccine prior to reconstitution: light yellow compact crystalline plug
- Reconstituted vaccine: clear yellow

(MMR-Var) ProQuad®:

- Diluent: sterile water, preservative free
- Vaccine prior to administration: white to pale yellow compact crystalline plug
- Reconstituted vaccine: clear pale yellow to light pink liquid

Informed Consent

- Clients must give informed consent before immunization
- Prior to immunizing, the immunizer must:
 - Determine that the client is eligible (based on current phase and/or eligibility requirements)
 - Review the disease being prevented
 - Review vaccine
- **Discuss:**
 - Risks and benefits of getting the vaccine and not getting the vaccine
 - Side effects and after care
 - How the vaccine is given
- Provide the opportunity to ask questions
- Affirm verbal consent, MMR and MMR-Var information pages can be used for informed consent

Fit To Immunize

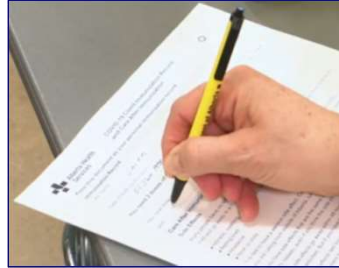
Prior to any vaccine, it must be determined whether the individual is fit to immunize.

[Fit to Immunize assessment:](#)

- Health status today
- History of allergies
- History of previous reactions
- History of chronic illness/medications
- Receipt of blood/blood products in the past year
- Pregnancy
- Receipt of live vaccine in past 3 months

Vaccine Documentation

- Information required to be recorded on all clients includes:
 - Client demographic information
 - full name, personal health number, date of birth, gender, address including postal code
- Reason code for immunization
- Dose number
- Vaccine name & lot number
- Dosage administered
- Site of injection
- Route of administration
- Date of immunization
- Immunizer's first initial and last name, designation & signature



73

Ordering

- Vaccine is available for ordering through the AVI (Alberta Vaccine Inventory) system.



74

7 Rights of Immunization

- ✓ Right product (vaccine)
- ✓ Right client
- ✓ Right dose
- ✓ Right time (date/time, interval between doses, usage expiry of vial)
- ✓ Right route, needle length, site/land marking and technique
- ✓ Right reason (meets eligibility criteria)
- ✓ Right documentation



75

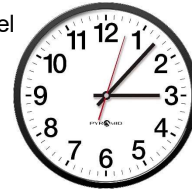
Anaphylaxis

- Anaphylaxis is an acute hypersensitivity reaction that can be potentially life-threatening.
- With prompt recognition and appropriate medication, anaphylaxis can be treated effectively.
- This clinical syndrome is a rare event, but it can and will occur with immunizations.
- As such, immunizers must possess the competency (knowledge and skills) to identify and manage an anaphylaxis reaction.

76

Anaphylaxis

- **Healthcare providers MUST review the anaphylactic directive and guideline before giving vaccines.**
 - *ISC CDC Guidelines for the Management of Anaphylaxis Related to Immunizations*
 - *ISC Management of Anaphylaxis Post-Immunization*
- **An EPI kit must be onsite when providing immunizations.**
- All clients should be encouraged to wait for 15 minutes after their immunization.
- For clients with any known anaphylactic allergies, extend this recommended wait period to **30 minutes**.
- Have clients remain within the clinic area and return immediate assessment if they feel unwell.



77

Well, that was a lot...

78

New to Immunizations?

- Never given a measles vaccine before? Don't worry, there's help.
- Buddy with an 'Immunization Champion' to participate in 'Watch one, Give one' training
 - o **Step 1:** Sit with a 'champion' and watch them complete a full visit and administer the vaccine
 - o **Step 2:** Have the 'champion' watch you do the same and then incorporate any feedback provided
 - o **Step 3:** Feeling confident? You may now vaccinate on your own
- **Who can be an 'Immunization Champion'?**
 - Nurse in your community who is experienced with immunizations (ex: Public Health Nurse)
 - Formal tracking/sign off **will not** be required by the Nursing Education Team
 - o Contact the Nursing Education Team for any questions:
santepublicquedgspniab-publichealthfnihbab@sac-isc.gc.ca

Resources

Resources reviewed or discussed in this presentation will be placed on OneHealth under a measles section.



Questions?

Contact information for future questions:

Anju Singh 403-463-5705

Melissa Evans 249-313-0306



Indigenous Services
Canada

Services aux
Autochtones Canada

Canada