MMR
Measles-Mumps-Rubella Combined Vaccine
Revision Date: May 7, 2019

Rationale for Update:
• Updated to align with Public Health Notifiable Disease Guidelines post-exposure recommendations for infants 6 to 11 months of age. (August 2018)
• Wording in contraindications and precautions updated to be consistent with MMR-Var biological page.

Please consult the Product Monograph\(^1,2\) for further information about the vaccine.

<table>
<thead>
<tr>
<th>M-M-R® II</th>
<th>PRIORIX®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Merck Canada Inc.</td>
</tr>
<tr>
<td>Licensed use</td>
<td>Individuals 12 months of age and older.</td>
</tr>
<tr>
<td>Off-license use</td>
<td>Infants 6 months up to and including 11 months of age who are:</td>
</tr>
<tr>
<td></td>
<td>➢ Travelling to areas where measles is circulating (see indications).</td>
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<tr>
<td></td>
<td>➢ Contact of a measles case (see indications for post-exposure).</td>
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</tbody>
</table>

Indications for use of provincially funded vaccine

Pre-exposure:
Children: 12 months up to and including 17 years of age.

Notes:
➢ Infants 6 months up to and including 11 months of age traveling to areas where measles is circulating in North America (Canada, USA and Mexico) and all countries outside of North America should receive one dose of measles-containing vaccine.\(^3\) Two additional doses of measles-containing vaccine should be administered at one year of age and older and with the appropriate interval between doses are required for long term protection.
➢ 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:

Measles
➢ Individuals born in 1970 or later without a documented history of two doses of measles-containing vaccine, history of laboratory confirmed measles disease or laboratory evidence of measles immunity.
➢ Health care workers (HCW), regardless of their year of birth, without a documented history of two doses of measles-containing vaccine, history of laboratory-confirmed measles disease or laboratory evidence of measles immunity.\(^4\)
➢ Students at post-secondary educational institutions born before 1970 without a documented history of measles-containing vaccine, history of laboratory-confirmed measles disease or laboratory evidence of measles immunity.\(^4\)
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 and who are travelling to areas where measles is circulating in North America (Canada, USA and Mexico) and all countries outside of North America should receive one dose of measles-containing vaccine.³

**Note:** Individuals born before 1970 (regardless of country of birth) are generally presumed to have acquired natural immunity to measles; however, some of these individuals may be susceptible.⁴

### Mumps

- Individuals born in 1970 or later without a documented history of two doses of mumps-containing vaccine or history of laboratory-confirmed mumps disease.
- HCW, regardless of their year of birth, without a documented history of two doses of mumps-containing vaccine or history of laboratory-confirmed mumps disease.⁴
- Students at post-secondary educational institutions born before 1970 without documented history of one dose of mumps-containing vaccine or history of laboratory-confirmed mumps disease.⁴

**Note:** Adults born before 1970 are generally presumed to have acquired natural immunity to mumps; however some of these individuals may still be susceptible.⁴

### Rubella

- Individuals born in 1957 or later⁵ without a documented history of one dose of rubella-containing vaccine, history of laboratory-confirmed rubella or laboratory evidence of rubella immunity.
- HCW (regardless of age) who have face-to-face contact with patients in health care facilities are required to have documented immunity to rubella under the Communicable Diseases Regulation, Alberta Regulation 238/1985.⁶
- Staff of daycare facilities (regardless of age). Communicable Diseases Regulation, Alberta Regulation 238/1985.⁶
- Rubella immunization should be prioritized for the following susceptible individuals:
  - Women of child-bearing age.
  - HCW
  - Staff of daycare facilities

**Note:** Adults born before 1957 are generally presumed to have immunity to rubella; however some of these individuals may still be susceptible.⁵

### Notes:

- Immunization of HIV-infected children and adults should be completed under the direction of the infectious disease specialist attending the individual.
- Child and adult recipients of hematopoietic stem cell transplant (HSCT). See:
  - Immunization for Child Hematopoietic Stem Cell Recipients
  - Immunization for Adult Hematopoietic Stem Cell Recipients.
- Child and adult candidates for solid organ transplant (SOT). See:
  - Immunization for Children Expecting Solid Organ Transplant before 18 Months of Age,
  - Immunization for Children Expecting Solid Organ Transplant after 18 Months of Age (Catch-up and Ongoing)
  - Immunization for Adult Solid Organ Transplant Candidates and Recipients.
### Post-exposure:

#### Measles

- Susceptible contacts of a measles case should receive either MMR or Immune Globulin (IG) depending upon the time-lapse from exposure, age and health status.
- Susceptible immunocompetent contacts 6 months of age and older should receive measles-containing vaccine. The vaccine should be administered within 72 hours of exposure and should not be delayed pending serology results.\(^7\)\(^,\)\(^8\)
- Children younger than four years 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.\(^8\)
- If measles-containing vaccine is contraindicated or if more than 72 hours since exposure have elapsed, Immune Globulin (IG) may be indicated, See Biological Products- Immune Globulin (Human).
- 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.\(^7\)

For disease investigation, contact assessment and reporting requirements, refer to *Public Health Notifiable Disease Guidelines – Measles*.\(^8\)

#### Mumps

- Susceptible contacts should be immunized.

**Note**: Post-exposure immunization with mumps-containing vaccine does not prevent or alter the clinical severity of mumps. However, if the exposure to mumps does not cause infection, the post-exposure immunization should induce protection against subsequent infection.\(^4\)

For disease investigation, contact assessment and reporting requirements refer to *Public Health Notifiable Disease Guidelines – Mumps*.\(^9\)

#### Rubella

- Susceptible contacts should be immunized.

**Note**: Post-exposure immunization with rubella-containing vaccine does not prevent or alter the clinical severity of rubella after exposure. However, if the exposure to rubella does not cause infection, the post-exposure immunization should induce protection against subsequent infection.\(^4\)

For disease investigation, contact assessment and reporting requirements refer to *Public Health Notifiable Disease Guidelines – Rubella*.\(^10\)

<p>| Use in infants younger than 12 months of age | Infants younger than 12 months of age may not respond sufficiently to the measles component of the vaccine in part due to the persistence of maternal measles antibody; therefore, any MMR-containing vaccine dose administered before 12 months of age should be repeated at 12 months of age or older.(^4) |
| Dose | 0.5 mL |
| Route | Subcutaneous |</p>
<table>
<thead>
<tr>
<th>Schedule</th>
<th>Children 12 months – 6 years of age:</th>
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<tbody>
<tr>
<td></td>
<td>Dose 1: 12 months of age</td>
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<tr>
<td></td>
<td>Dose 2: 4 years of age</td>
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</table>

**Notes:**
- If the first dose is administered at four years of age or older, the second dose may be administered with a minimum interval of four weeks between the doses.
- Children traveling to areas where measles is circulating in North America (Canada, USA and Mexico) and all countries outside of North America should have two doses of measles-containing vaccine with the appropriate minimum interval between doses dependent upon the measles-containing vaccine used.³

**7 – 17 years of age:**
- Dose 1: day 0
- Dose 2: four weeks after dose 1

**Notes:**
- Most children in Alberta routinely receive measles, mumps, rubella and varicella combined vaccine at 12 months and 4 years of age.
- Infants 6 – 11 months of age who receive a dose of measles-containing vaccine before 12 months of age require two additional doses of MMR-containing vaccine. Both doses must be administered on or after the first birthday and separated by the appropriate interval.

**Adults (18 years of age and older):**

### Measles

- **Adults born in 1970 or later:**
  - Two life-time doses with at least four weeks between doses.
- **Health care workers:**
  - Two life-time doses with at least four weeks between doses.⁴
- **Students at post-secondary educational institutions born before 1970:**
  - One life-time dose.⁴

**Note:** Individuals with two documented doses of a measles-containing vaccine do not require a third dose regardless of negative or indeterminate measles serology. Such persons should be considered to have presumptive evidence of immunity.¹¹

### Mumps

- **Adults born in 1970 or later:**
  - Two life-time doses with at least four weeks between doses.
- **Health care workers:**
  - Two life-time doses with at least four weeks between doses.⁴
- **Students at post-secondary educational institutions,**
  - Born before 1970 - one life-time dose should be considered.⁴

### Rubella

- **Adults born in 1957 or later:**
  - One life-time dose.⁵
- **Health care workers and staff of daycare facilities (regardless of age):**
  - One life-time dose.⁶
### Contraindications
- Known severe hypersensitivity to any component of MMR vaccine.\(^1\,^2\,^4\)
- Anaphylactic reaction to a previous dose of vaccine containing measles, mumps or rubella antigens.\(^4\)
- Pregnancy.\(^1\,^2\)
- Impaired immune function, including those with primary or secondary immunodeficiency.\(^1\,^2\)
- Active untreated tuberculosis.\(^4\)
- Immunosuppressive therapy (including high dose corticosteroids).\(^1\,^4\)
- Family history of congenital or hereditary immunodeficiency, unless the immune competence of the potential vaccine recipient is demonstrated.\(^4\)
- Solid organ transplant recipients. See:
  - [Immunization for Children Expecting Solid Organ Transplant before 18 Months of Age](#)
  - [Immunization for Children Expecting Solid Organ Transplant after 18 Months of Age (Catch-up and Ongoing)](#)
  - [Immunization for Adult Solid Organ Transplant Candidates and Recipients](#)
- Recent (within the previous 11 months) administration of immune globulins and blood products. The interval between the receipt of IG or a blood product and the subsequent MMR administration is dependent upon the IG of blood product received and the dosage administered.\(^4\)

Refer to [Assessment Expected Prior to Vaccine Administration](#) – Guidelines for Interval between Blood Products and Live Vaccines. See also Canadian Immunization Guide \(^4\) – Blood products, human immune globulin and timing of immunization

### Precautions
- Egg allergy is not a contraindication to immunization with MMR vaccine.\(^4\) See [Assessment Expected Prior to Vaccine Administration](#).
- The risk for vaccine-associated thrombocytopenia may be higher for persons who previously had thrombocytopenia, especially if it occurred in temporal association with an earlier MMR immunization.\(^15\,^16\) Individuals, who develop vaccine-associated thrombocytopenia, should have serology to assess immunity to measles, mumps and rubella.\(^17\) A second dose of vaccine should only be administered if non-immune and after careful consideration of the risks and benefits of the vaccine.
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-containing vaccines have such an effect. It may be prudent to avoid vaccine in those with active TB disease until treatment is underway. Consultation with attending physician is recommended.  

- Immunization with a measles-containing vaccine can temporarily 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.  

- Live attenuated influenza vaccine (LAIV) may be administered any time before or after the administration of live parenteral vaccines (MMR, MMR-Var and VZ).

### Possible reactions

<table>
<thead>
<tr>
<th>Common:</th>
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| • Redness, pain and swelling at the injection site.  
• Burning and/or stinging of short duration at injection site.  
• Fever, irritability, rash, malaise  
• Upper respiratory tract infection, ear pain/infection, conjunctivitis, nasopharyngitis  
• Diarrhea, vomiting  
• Arthralgia and/or arthritis (usually transient and rarely recurs) may occur 1 – 3 weeks following immunization, with symptoms lasting for 1 – 3 weeks. Arthralgia/arthritis symptoms are more common in post-pubertal girls. |

<table>
<thead>
<tr>
<th>Uncommon:</th>
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| • Otitis media, lymphadenopathy, anorexia, nervousness, abnormal crying, insomnia, bronchitis, cough, rhinitis, parotid gland enlargement, parotitis  
• Allergic reaction, anaphylaxis  
• Febrile convulsions  
• Immune Thrombocytopenic Purpura (ITP) within 6 weeks after immunization  
• Encephalitis and encephalopathy |

<table>
<thead>
<tr>
<th>Rare:</th>
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</table>
| • Allergic reaction, anaphylaxis  
• Febrile convulsions  
• Immune Thrombocytopenic Purpura (ITP) within 6 weeks after immunization  
• Encephalitis and encephalopathy |

**For M-M-R® II only:**

- Additional possible adverse events following immunization reported through post-market surveillance include: subacute sclerosing panencephalitis, aseptic meningitis, encephalitis/encephalopathy and panniculitis.

**For PRIORIX® only:**

- Additional possible adverse events following immunization reported through post-market surveillance include: arthralgia, arthritis, meningitis, aseptic meningitis, anaphylactic reactions, transverse myelitis, Guillain-Barré syndrome, peripheral neuritis, encephalitis, cerebellitis, cerebellitis-like symptoms (including transient gait disturbance and transient ataxia), thrombocytopenia, thrombocytopenic purpura, vasculitis (including Henoch Schonlein purpura and Kawasaki syndrome), measles-like syndrome, mumps- like syndrome (including orchitis, epididymitis and parotitis) and erythema multiforme.
<table>
<thead>
<tr>
<th><strong>Pregnancy</strong></th>
<th>MMR vaccine is contraindicated in pregnant women. Women of child-bearing potential should be advised to delay pregnancy for four weeks following immunization.</th>
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</thead>
<tbody>
<tr>
<td><strong>Lactation</strong></td>
<td>Breastfeeding mothers may be safely immunized with MMR vaccine.</td>
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</tbody>
</table>
| **Program Notes** | **Program Notes:**  
  - 1982 October 1 – MMR®ll introduced into routine program for 12 months of age.  
  - 1983 September 04 to 1986 – MMR catch-up program for Grade 1 and 6.  
  - 1996 June – MMR routine program second dose for 4-6 year olds.  
  - 2008 February 14 – Mumps-containing vaccine two doses for HCWs and post-secondary students born in 1970 or later.  
  - 2010 September 1 – MMR-Var (Priorix-Tetra®) replaced MMR at 12 months for routine program.  
  - 2017 June 1 – Adults born in or after 1970 eligible for 2 doses of mumps-containing vaccine.  
  - 2018 April – Updated rubella vaccine indications to include: adults born before 1957 generally presumed to have immunity to rubella.  

**Historical Notes:**  
- 1971 January 1 – Rubella became available.  
- 1972 January 1 to 1982 January 1 – Rubella (school program for Grade 6 girls)  
- 1982 February 1 to 2004 February 8 – Mumpsvax  
- 1997 January 1 to 1997 December 31 – Measles/Rubella second dose measles catch-up for Grades 1 to 9.  
- 1997 April 1 to 1998 June 30 – Measles (red) second dose measles catch-up for Grades 1 to 9 using monovalent measles vaccine.  
- 2013 September 26 – Two lifetime doses of mumps-containing vaccine recommended for all adults born in 1970 or later and HCWs regardless of year of birth.
References


