Immunization Protocol

Measles, mumps and rubella-containing Combination Vaccines (MMRII® and ProQuad®)

<table>
<thead>
<tr>
<th>Last Reviewed</th>
<th>24 September 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last Revised</td>
<td>24 September 2021</td>
</tr>
<tr>
<td>This order expires</td>
<td>31 October 2023</td>
</tr>
</tbody>
</table>

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1. What’s new
Updated formatting.

2. Oregon immunization protocol
   A. Check the ALERT Immunization Information System (IIS) to determine whether the patient needs this vaccine and any other vaccines.
   B. Screen clients for contraindications and precautions.
   C. Provide a current Vaccine Information Statement (VIS), answering any questions.
   D. Record all required data elements in the client’s permanent health record.
E. Verify needle length for subcutaneous (SQ) injection.
F. Administer a 0.5-mL dose of MMR or MMRV SQ
G. May be given simultaneously with all routinely recommended vaccines. Do not give simultaneously with immune globulin.
H. Ask client to remain seated in the clinic for 15 minutes after vaccination to reduce the risk of injury should they faint.

<table>
<thead>
<tr>
<th>Health Officer Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Health Officer Signature</td>
<td>Date</td>
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3. Vaccine schedule for MMR\(^1\) and MMRV\(^2\)

<table>
<thead>
<tr>
<th>Dose and Route – 0.5-mL, SQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MMR Vaccine</strong></td>
</tr>
<tr>
<td>Dose</td>
</tr>
<tr>
<td>1*</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td><strong>MMRV Vaccine</strong></td>
</tr>
<tr>
<td>Dose</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

* MMR is recommended for the first dose in children under 4 years of age due to increased risk of febrile seizures with MMRV. Parental preference for MMRV may be accommodated after discussion of risks and benefits.\(^5\)
4. Licensed MMR and MMRV vaccine

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Vaccine Components</th>
<th>Presentation</th>
<th>Acceptable Age Range</th>
<th>Thimerosal</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMRII¹</td>
<td>MMR</td>
<td>0.5-mL single-dose vaccine vials and 0.5-mL single-dose diluent vials</td>
<td>≥ 12 months</td>
<td>None</td>
</tr>
<tr>
<td>ProQuad²</td>
<td>MMRV</td>
<td></td>
<td>12 months – 12 years</td>
<td></td>
</tr>
</tbody>
</table>

5. Recommendations for use³

A. **Preschool-Aged Children**: All children should routinely receive the first dose of MMR vaccine as soon as possible upon reaching 1 year of age.

B. **School-Aged Children**: All children should routinely receive the second dose of MMR vaccine at 4-6 years of age. In Oregon, the second MMR is required for school attendance, beginning in kindergarten.

C. **Students in Colleges and Universities, Healthcare Workers, HIV+ Persons, International Travelers, and Household and Close Contacts of Immunocompromised Persons**: Persons without evidence of immunity need two doses of MMR, at least 28 days apart. Infants ≥ 6 months of age traveling internationally should receive a dose of MMR. Any doses given prior to 12 months of age do not count towards the two-dose series.

D. **Pre- and Post-partum persons**: Persons without immunity to rubella should receive MMR upon completion or termination of pregnancy.

E. **All Other Adults**: Persons born after 1956 without evidence of immunity need at least one dose of MMR vaccine.

F. **Persons with HIV**: Persons without evidence of current severe immunosuppression who are not immune need two doses of MMR, at least 28 days apart. MMRV is contraindicated for persons with HIV.

G. **Measles Post-Exposure Prophylaxis**: MMR vaccine, if administered within 72 hours of initial exposure, might provide some protection or modify the clinical course of measles. For more information, see the Immune Globulin for the Prevention of Hepatitis A or Measles immunization protocol.

H. **Community Measles Outbreaks**: During community outbreaks of measles, any patient without two verified doses of MMR vaccine may receive an additional dose. Infants ≥ 6 months of age may receive a dose of MMR. Any doses given prior to 12 months of age do not count towards the two-dose series.

I. **Mumps Outbreaks**: Persons at increased risk for acquiring mumps due to prolonged or intense exposure who have received <2 doses of mumps-virus
containing vaccine or have unknown vaccination status should receive 1 dose of MMR.

6. Contraindications:³

A. **Allergy**: Severe allergic reaction (e.g., anaphylaxis) to a previous dose or to any vaccine component.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Vaccine Excipient Summary⁷</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMRV</td>
<td>sorbitol, sucrose, hydrolyzed gelatin, recombinant human albumin, neomycin, fetal bovine serum, WI-38 human diploid lung fibroblasts</td>
</tr>
<tr>
<td>ProQuad</td>
<td>MRC-5 cells including DNA and protein, sucrose, hydrolyzed gelatin, sodium chloride, sorbitol, monosodium L-glutamate, sodium phosphate dibasic, recombinant human albumin, sodium bicarbonate, potassium phosphate monobasic, potassium chloride, potassium phosphate dibasic, neomycin, bovine calf serum, other buffer and media ingredients</td>
</tr>
</tbody>
</table>

B. **Pregnancy**: MMR vaccines should not be administered to women known to be pregnant or attempting to become pregnant.³

C. **Immunodeficiency**: MMR and MMRV should not be administered to persons with primary or acquired Immunodeficiency.³

   a. Persons with HIV who are not currently severely immunosuppressed may receive MMR. MMRV is contraindicated in persons with HIV.

   b. Persons who have a family history of congenital or hereditary immunodeficiency in first-degree relatives (e.g., parents and siblings), should not receive MMR or MMRV unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory.

   c. Persons receiving systemic immunosuppressive therapy, including corticosteroids ≥2 mg/kg of body weight or ≥20 mg/day of prednisone (or equivalent) for persons who weigh >10 kg, when administered for ≥2 weeks, should not receive MMR or MMRV.

D. **IG**: Do not administer MMR or MMRV simultaneously with immune globulin.³
7. Warnings and precautions:

A. Moderate or severe illness, with or without fever.  

B. Antibody-containing blood products: Receipt of antibody-containing blood products (e.g., IG, whole blood, or packed red blood cells) might interfere with the serologic response to measles and rubella vaccine for variable periods, depending on the dose of IG administered.  

   a. MMR vaccine should be administered to persons who have received an IG preparation only after the recommended intervals have elapsed.  

   b. Do not delay postpartum administration of MMR to women who lack immunity to rubella due to administration of Rho(D) IG (human) or any other blood product received at delivery or during the last trimester of pregnancy. Vaccinate immediately and test for immunity to rubella and measles 3 months later.  

C. Tuberculosis testing: TB skin tests may be administered simultaneously with MMR or MMRV vaccine. If not administered simultaneously, wait 4-6 weeks after vaccination to place the TB test.  

D. Personal or Family History of Seizures: A personal or family (i.e., sibling or parent) history of seizures of any etiology is a precaution for the first dose of MMRV but not MMR vaccination.  

E. History of thrombocytopenia or thrombocytopenic purpura: Persons who have a history of thrombocytopenia or thrombocytopenic purpura might be at increased risk for developing clinically significant thrombocytopenia after MMR or MMRV vaccination.  

F. Simultaneous and non-simultaneous vaccination with live vaccines: Two or more live vaccines may be administered on the same clinic day. Live vaccines not administered simultaneously need to be separated by 28 days. If not separated by at least 28 days, the vaccine administered second needs to be repeated at least 28 days later.  

G. Salicylate Therapy: Avoid the use of salicylates (aspirin) or salicylate-containing products in children aged 12 months to 12 years for six weeks following vaccination wth MMRV due to the association of Reye Syndrome with salicylate therapy and wild-type varicella infection.  

8. Other considerations:

<table>
<thead>
<tr>
<th>Acceptable Evidence of Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>For routine purposes, persons who meet the criteria below are considered immune to Measles, Mumps, or Rubella, respectively.</td>
</tr>
</tbody>
</table>
# Measles or Mumps

- Documentation of vaccination with a live measles- or mumps- virus containing vaccine:
  - PreK: 1 dose
  - K-12: 2 doses
  - Adults at low risk: 1 dose
- Laboratory evidence of immunity;
- Laboratory confirmation of disease;
- Birth before 1957.

## Routine Vaccination

- Documentation of vaccination with 2 doses of live measles- or mumps-virus containing vaccine
- Laboratory evidence of immunity;
- Laboratory confirmation of disease;
- Birth before 1957.

## College or University Students

- Documentation of vaccination with 2 doses of live measles- or mumps-virus containing vaccine
- Laboratory evidence of immunity;
- Laboratory confirmation of disease;
- Birth before 1957.

### International Travelers, Healthcare Workers, HIV+ persons, Household and Close Contacts of Immunocompromised Persons.

- Documentation of vaccination with a live measles- or mumps- virus containing vaccine:
  - Infants 6-11 months (measles): 1 dose
  - ≥ 12 months: 2 doses
- Laboratory evidence of immunity;
- Laboratory confirmation of disease;
- Birth before 1957.

## Rubella

- Documentation of 1 dose of live rubella virus-containing vaccine;
- Laboratory evidence of immunity;
- Laboratory confirmation of disease;
- Birth before 1957.

# Side effects and adverse reactions

<table>
<thead>
<tr>
<th>Adverse Event</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain, redness or swelling at the injection site²</td>
<td>Up to 27%</td>
</tr>
<tr>
<td>Arthralgia, arthritis-like symptoms³</td>
<td>10-30% in post-pubertal women</td>
</tr>
<tr>
<td>Fever³</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>Transient rashes³</td>
<td>5%</td>
</tr>
<tr>
<td>Transient lymphadenopathy³</td>
<td>5% children, 20% adults</td>
</tr>
<tr>
<td>Parotitis³</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

*Symptoms typically begin 1-3 weeks after vaccination, usually are mild, last approximately 2 days and are not incapacitating.*
10. Storage and handling

All clinics and pharmacies enrolled with the Vaccines for Children (VFC) Program must immediately report any storage and handling deviations to the Oregon Immunization Program at 971-673-4VFC (4823).

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Temp</th>
<th>Storage Issues</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR II</td>
<td>-50° to 8°C</td>
<td>Vaccine may be stored frozen. Before reconstitution, refrigerate vaccine at 2°-8°C (36° to 46°F).</td>
<td>Protect from light. Use immediately after reconstitution. If not used, may be stored at 2°-8°C, protected from light, for up to 8 hours.</td>
</tr>
<tr>
<td>MMR II (diluent)</td>
<td>2° to 8°C</td>
<td>Diluent may be stored refrigerated or at room temperature.</td>
<td>Do not freeze.</td>
</tr>
<tr>
<td>ProQuad</td>
<td>-50° to -15°C</td>
<td>Store frozen to maintain potency. Vaccine may be stored in the refrigerator for up to 72 hours before reconstitution.</td>
<td>Reconstituted vaccine may be stored at room temperature, protected from light, for up to 30 minutes. Do not freeze reconstituted vaccine.</td>
</tr>
<tr>
<td>ProQuad (diluent)</td>
<td>2° to 25°C</td>
<td>Diluent may be stored refrigerated or at room temperature.</td>
<td>Do not freeze.</td>
</tr>
</tbody>
</table>

11. Adverse events reporting

Report adverse events online to the Vaccine Adverse Events Reporting System (VAERS) at https://vaers.hhs.gov/reportevent.html.

VAERS Reporting Table:
https://vaers.hhs.gov/docs/VAERS_Table_of_Reportable_Events_Following_Vaccination.pdf

<table>
<thead>
<tr>
<th>Event and interval from vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Anaphylaxis or anaphylactic shock (7 days)</td>
</tr>
<tr>
<td>B. Encephalopathy or encephalitis (15 days)</td>
</tr>
<tr>
<td>C. Chronic arthritis (42 days)</td>
</tr>
<tr>
<td>D. Thrombocytopenic purpura (7-30 days)</td>
</tr>
<tr>
<td>E. Vaccine-strain measles viral infection in an immunodeficient recipient</td>
</tr>
<tr>
<td>F. Shoulder Injury Related to Vaccine Administration (7 days)</td>
</tr>
</tbody>
</table>
A pharmacist who administers any vaccine must report to the OHA ALERT Immunization Information System in a manner prescribed by OHA within 15 days of administration. Oregon Administrative Rule 855-019-0290(2).

12. References


To request this material in an alternative format (e.g., Braille) or to clarify any part of the above order, contact the Oregon Health Authority Immunization Program at 971.673.0300 and 711 for TTY. For other questions, consult with the vaccine recipient’s primary health care provider or a consulting physician.

Electronic copy of this standing order is available at: standing orders
Electronic copy of this pharmacy protocol is available at: protocols

13. Appendix A


<table>
<thead>
<tr>
<th>Product/Indication</th>
<th>Dose (mg IgG/kg) and route(^a)</th>
<th>Recommended interval before measles- or live varicella-containing vaccine(^b) administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood transfusion—RBCs, washed</td>
<td>10 mL/kg, negligible IgG/kg IV</td>
<td>None</td>
</tr>
<tr>
<td>Blood transfusion—RBCs, adenine-saline added</td>
<td>10 mL/kg (10 mg IgG/kg) IV</td>
<td>3 months</td>
</tr>
<tr>
<td>Blood transfusion—Packed RBCs (hematocrit 65(^c))</td>
<td>10 mL/kg (60 mg IgG/kg) IV</td>
<td>6 months</td>
</tr>
<tr>
<td>Blood transfusion—Whole blood (hematocrit 35%-50(^a))</td>
<td>10 mL/kg (80-100 mg IgG/kg) IV</td>
<td>6 months</td>
</tr>
<tr>
<td>Blood transfusion—Plasma/platelet products</td>
<td>10 mL/kg (160 mg IgG/kg) IV</td>
<td>7 months</td>
</tr>
<tr>
<td>Botulinum Immune Globulin Intravenous (Human)</td>
<td>1.0 mL/kg (50 mg IgG/kg) IV</td>
<td>6 months</td>
</tr>
<tr>
<td>Cytomegalovirus IGIV</td>
<td>150 mg/kg maximum</td>
<td>6 months</td>
</tr>
<tr>
<td>Hepatitis A IG—Contact prophylaxis</td>
<td>0.1 mL/kg (16.5 mg IgG/kg) IM</td>
<td>6 months (^d)</td>
</tr>
<tr>
<td>Hepatitis A IG—International travel, &lt;1 month stay</td>
<td>0.1 mL/kg (16.5 mg IgG/kg) IM</td>
<td>6 months (^d)</td>
</tr>
<tr>
<td>Hepatitis A IG—International travel, ≥1 month stay</td>
<td>0.2 mL/kg (33 mg IgG/kg) IM</td>
<td>6 months (^d)</td>
</tr>
<tr>
<td>Hepatitis B IG</td>
<td>0.06 mL/kg (10 mg IgG/kg) IM</td>
<td>3 months</td>
</tr>
<tr>
<td>IGIV—Replacement therapy for immune deficiencies(^e)</td>
<td>300-400 mg/kg IV</td>
<td>8 months</td>
</tr>
<tr>
<td>IGIV—Immune thrombocytopenic purpura treatment</td>
<td>400 mg/kg IV</td>
<td>8 months</td>
</tr>
<tr>
<td>IGIV—Postexposure varicella prophylaxis</td>
<td>400 mg/kg IV</td>
<td>8 months</td>
</tr>
<tr>
<td>IGIV—Postexposure measles prophylaxis for immunocompromised contacts</td>
<td>400 mg/kg IV</td>
<td>8 months</td>
</tr>
<tr>
<td>IGIV—Immune thrombocytopenic purpura treatment</td>
<td>1000 mg/kg IV</td>
<td>10 months</td>
</tr>
<tr>
<td>IGIV—Kawasaki disease</td>
<td>2 g/kg IV</td>
<td>11 months</td>
</tr>
<tr>
<td>Measles prophylaxis IG—Standard (i.e., immunocompromised) contact</td>
<td>0.50 mL/kg (80 mg IgG/kg) IM</td>
<td>6 months</td>
</tr>
<tr>
<td>Monoclonal antibody to respiratory syncytial virus F protein (e.g., Synagis [MedImmune])(^n)</td>
<td>15 mg/kg IM</td>
<td>None</td>
</tr>
<tr>
<td>Rabies IG</td>
<td>20 IU/kg (22 mg IgG/kg) IM</td>
<td>4 months</td>
</tr>
<tr>
<td>Tetanus IG</td>
<td>250 units (10 mg IgG/kg) IM</td>
<td>3 months</td>
</tr>
<tr>
<td>Varicella IG</td>
<td>125 units/10 kg (60-200 mg IgG/kg) IM, maximum 625 units</td>
<td>5 months</td>
</tr>
</tbody>
</table>
**Abbreviations:** HIV = human immunodeficiency virus; IG = immune globulin; IgG = immune globulin G; IGIV = intravenous immune globulin; mg IgG/kg = milligrams of immune globulin G per kilogram of body weight; IM = intramuscular; IV = intravenous; RBCs = red blood cells.

(a) This table is not intended for determining the correct indications and dosages for using antibody-containing products. Unvaccinated persons might not be protected fully against measles during the entire recommended interval, and additional doses of IG or measles vaccine might be indicated after measles exposure. Concentrations of measles antibody in an IG preparation can vary by manufacturer’s lot. Rates of antibody clearance after receipt of an IG preparation also might vary. Recommended intervals are extrapolated from an estimated half-life of 30 days for passively acquired antibody and an observed interference with the immune response to measles vaccine for 5 months after a dose of 80 mg IgG/kg. Sources: Mason W, Takahashi M, Schneider T. Persisting passively acquired measles antibody following gamma globulin therapy for Kawasaki disease and response to live virus vaccination [Abstract 311]. Presented at the 32 meeting of the Interscience Conference on Antimicrobial Agents and Chemotherapy, Los Angeles, California, October, 1992, AND Siber GR, Werner BG, Halsey NA, et al. Interference of immune globulin with measles and rubella immunization. J Pediatr. 1993;122(2):204-211. DOI: 10.1016/ S0022-3476(06)80114-9, AND Mason WH, Schneider TL, Takahashi M. Duration of passively acquired measles antibody and response to live virus vaccination allowing gamma globulin therapy for Kawasaki syndrome. Prog Pediatr Cardiol. 1992;1(1):82. DOI: 10.1016/S1058-9813(06)80067-6. The extrapolation is performed by counting months from 80 mg down to (1-3 mg) (e.g. 80 >>> 40 >> >20 >> >10 >>> 5>>>2.5….equal to FIVE intervals) and adding a grace month, so 80 mg values take a “6 month” interval).

(b) Does not include zoster vaccine recombinant because this vaccine is non-live.

(c) Assumes a serum IgG concentration of 16 mg/mL.

(d) The reason the interval is 6 months (and not 4 months) is that the quantity of 16.5 IgG/kg does not reflect the upper ceiling of the quantity of measles IgG in the product.

(e) Measles vaccination is recommended for children with mild or moderate immunosuppression from HIV infection, and varicella vaccination may be considered for children with mild or moderate immunosuppression from HIV infection, but both are contraindicated for persons with severe immunosuppression from HIV or any other immunosuppressive disorder.

(f) Contains antibody only to respiratory syncytial virus.