Immunization Protocol

Measles, mumps and rubella-containing Combination Vaccines (M-M-R®II, PRIORIX™ and ProQuad®)	
Last Reviewed	28 April 2025
Last Revised	28 April 2025
This order expires	30 April 2027

Table of contents

1. What's new

Updated references.

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) or intramuscular (IM) injection.

F. Administer

1) a 0.5-mL dose of M-M-R II or MMRV SQ or IM; or

2) a 0.5-mL dose of Priorix SQ.

G. May be given simultaneously with all routinely recommended vaccines. Do not give simultaneously with immune globulin.

H. Ensure epinephrine hydrochloride solution (1:1,000), oxygen and other appropriate agents and equipment are available for immediate use in case of anaphylactic or acute hypersensitivity reaction. Refer to Guidelines for Managing Adverse Events Following Immunization.

I. Ask client to remain seated in the clinic for 15 minutes after vaccination to reduce the risk of injury should they faint.

Health Officer Signature Date

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3. Vaccine schedule for MMR[1,3] and MMRV[2]

Dose and Route – 0.5 mL			
M-M-R II Vaccine (SQ or IM)			
Priorix Vaccine (SQ only)			
Dose	**Preferred age**	**Minimum acceptable age**	**Minimum acceptable spacing**
1*	12–15 months	12 months†	
2	4–6 years	13 months	28 days
MMRV ProQuad Vaccine (SQ or IM)			
Dose	**Preferred age**	**Minimum acceptable age**	**Minimum acceptable spacing**
1	12–15 months	12 months	
2	4–6 Years	15 months	3 months

*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]

†Infants 6 through <12 months traveling internationally should receive a dose of MMR. This dose doesn't count towards the MMR series.[4]

4. Licensed MMR and MMRV vaccine

Product Name	Vaccine Components	Presentation	Acceptable Age Range
M-M-R II[1]	MMR	Single-dose lyophilized vaccine vials and 0.5-mL single-dose diluent vials	≥12 months
Priorix[3]	MMR	Single-dose lyophilized vaccine vials and prefilled diluent syringes without needles. Dose after reconstitution is ~0.5-mL	≥12 months
ProQuad[2]	MMRV	Single-dose lyophilized vaccine vials and 0.5-mL single-dose diluent vials	12 months – 12 years

5. Recommendations for use[4,5,7]

A. **Infants and Toddlers**: All children should routinely receive the first dose of MMR vaccine as soon as possible upon reaching 1 year of age. The second dose is typically given at 4-6 years of age but may be given at any time if minimum spacing is observed.

B. **School-Aged Children**: All children need 2 doses of MMR vaccine. The second dose is typically given at kindergarten entry, at 4-5 years of age, but may be given sooner.

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 <3 doses of mumps-virus containing vaccine or have unknown vaccination status should receive 1 dose of MMR.

6. Contraindications:[4,7]

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

Vaccine	Vaccine Excipient Summary[9]
M-M-R II	sorbitol, sucrose, hydrolyzed gelatin, recombinant human albumin, neomycin, fetal bovine serum, WI-38 human diploid lung fibroblasts
Priorix	Anhydrous lactose, sorbitol, amino acids, mannitol, neomycin sulphate, ovalbumin, and bovine serum albumin.[3]
ProQuad	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

B. **Pregnancy**: MMR vaccines should not be administered to women known to be pregnant or attempting to become pregnant.[4]

C. **Immunodeficiency**: MMR and MMRV should not be administered to persons with primary or acquired Immunodeficiency.[4]

   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.[4]

7. Warnings and precautions:

A. Moderate or severe illness, with or without fever.[8]

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.[4]

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

2) 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.[4]

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.[4]

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.[4]

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.[8]

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 with MMRV due to the association of Reye Syndrome with salicylate therapy and wild-type varicella infection.

8. Other considerations:

Acceptable Evidence of Immunity[4]		
For routine purposes, persons who meet the criteria below are considered immune to Measles, Mumps, or Rubella, respectively.		
	Measles or Mumps	**Rubella**
Routine Vaccination	• 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.	• Documentation of 1 dose of live rubella 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.	

9. Side effects and adverse reactions

Adverse Event	**Frequency[1-4]**
Pain, redness or swelling at the injection site	Up to 27%

Irritability	Up to 63%
Arthralgia, arthritis-like symptoms*[4]	10–30% in post-pubertal women
Fever	Up to 35%
Transient rashes	5%
Transient lymphadenopathy	5% children, 20% adults
Parotitis	<1%

*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).

Vaccine	Temp	Storage Issues	Notes
M-M-R II[1]	-50° to 8°C (-58° to 46°F)	Vaccine may be stored frozen.	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.
M-M-R II (diluent)[1]	2°–8°C (36°–46°F)	Diluent may be stored refrigerated or at room temperature.	Do not freeze.
Priorix[3]	2°–8°C (36°–46°F)	Do not freeze.	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.
Priorix (diluent)[3]	2°–8°C (36°–46°F)	Diluent may be stored refrigerated or at room temperature (up to 25°C or 77°F).	Do not freeze.
ProQuad[2]	-50° to -15°C (-58° to 5°F)	Store frozen to maintain potency. Vaccine may be stored in the refrigerator for up to	Reconstituted vaccine may be stored at room temperature, protected from light, for up to 30

		72 hours before reconstitution.	minutes. Do not freeze reconstituted vaccine.
ProQuad (diluent)[2]	2°–25°C (36°–77°F)	Diluent may be stored refrigerated or at room temperature.	Do not freeze.

11. Adverse events reporting

Report adverse events online to the Vaccine Adverse Events Reporting System (VAERS) here.

VAERS Reporting Table:

Event and interval from vaccination
A. Anaphylaxis or anaphylactic shock (7 days) B. Encephalopathy or encephalitis (15 days) C. Chronic arthritis (42 days) D. Thrombocytopenic purpura (7–30 days) E. Vaccine-strain measles viral infection in an immunodeficient recipient F. Shoulder Injury Related to Vaccine Administration (7 days) G. Vasovagal syncope (7 days) H. Any acute complications or sequelae (including death) of above events (interval - not applicable) I. Events described in manufacturer's package insert as contraindications to additional doses of vaccine.

12. References

1. M-M-R II® package insert (November 2024). Available at www.fda.gov/media/75191/download. Accessed 27 April 2025.
2. ProQuad® package insert (November 2024). Available at www.fda.gov/media/147563/download. Accessed 27 April 2025.
3. Priorix™ package insert (June 2022). Available at www.fda.gov/media/158941/download. Accessed 27 April 2025.
4. McLean H, Fiebelkorn A, Temte J, Wallace G. Prevention of measles, rubella, congenital rubella syndrome, and mumps, 2013 summary: recommendations of the ACIP. MMWR 2013; 62(RR04):1–34. Available at www.cdc.gov/mmwr/pdf/rr/rr6204.pdf. Accessed 27 April 2025.
5. Marin M, Marlow M, Moore K, Patel M. Recommendation of the ACIP for use of a third dose of mumps virus-containing vaccine in persons at increased risk for mumps during an outbreak. MMWR 2018; 67:33–8. Available at

www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6701a7-H.pdf. Accessed 27 April 2025.

6. Marin M, Broder K, Temte J, Snider D, Seward J. Use of combination measles, mumps, rubella, and varicella vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2010; 59(RR03):1–12. Available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5903a1.htm. Accessed 27 April 2025.
7. Krow-Lucal E, Marin M, Shepersky L, Bahta L, Loehr J, Dooling K. Measles, mumps, rubella vaccine (Priorix): Recommendations of the Advisory Committee on Immunization Practices—United States, 2022. MMWR 2022;71:1465–70. Available at http://dx.doi.org/10.15585/mmwr.mm7146a1. Accessed 27 April 2025.
8. CDC General Best Practice Guidelines for Immunization. Updated July 25, 2024. Available at https://www.cdc.gov/vaccines/hcp/imz-best-practices/index.html. Accessed 27 April 2025.
9. Johns Hopkins Institute for Vaccine Safety, Excipients in Routinely Recommended Vaccines. April 7, 2025. https://www.vaccinesafety.edu/wp-content/uploads/2025/01/Components-Excipients-24-1220-by-Vaccine-Name-.pdf. Accessed 27 April 2025

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 800-980-9431 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

13. Appendix A

From BC Centre for Disease Control. Communicable Disease Manual. March 2024. Available at: http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Guidelines%20and%20Manuals/Epid/CD%20Manual/Chapter%202%20-%20Imms/Part4/Ig_BloodTimingIntervals.pdf

Immune Globulin Preparations or Blood: Timing Intervals for Vaccines Containing Live Measles, Mumps, Rubella or Varicella Virus

Immune globulin preparations and/or blood products can interfere with the immune response of a measles, mumps, rubella or varicella-containing vaccine. For measles (routinely given as MMR) and varicella vaccines, the recommended interval between immune globulin or blood product administration and subsequent vaccination varies depending on the specific product and dose given (see table below).

There is minimal or no interaction between blood products or immune globulin preparations and:

- inactivated vaccines
- live oral vaccines (rotavirus, oral typhoid vaccines)
- live intranasal vaccine (live attenuated influenza vaccine)
- Bacille Calmette-Guerin (BCG) vaccine
- yellow fever vaccine

If the immune globulin preparation or blood products are given 14 or more days after MMR, MMRV or varicella vaccine, the **immunization does not need to be repeated**.

If the interval between administration of **MMR, MMRV or varicella** vaccine and subsequent administration of an immune globulin preparation or blood product is **less than 14 days, immunization should be repeated at the interval indicated in the tables that follow**.

Product	Indication	Dose and Route	Interval (months)
Standard Immune Globulin			
Immune Globulin (**Ig**)	Hepatitis A prophylaxis	0.1 mL/kg **IM**	6
	Measles prophylaxis	0.5 mL/kg **IM** (max 15 mL)	6
Intravenous Immune Globulin (**IVIg**) or Subcutaneous Immune Globulin (**SCIg**) [A]	Treatment of antibody deficiency	300-400 mg/kg **IV**	8
	Measles prophylaxis	400 mg/kg **IV**	8
	Treatment of Idiopathic Thrombocytopenic Purpura	1,000 mg/kg **IV**	10
	Kawasaki Disease	2,000 mg/kg **IV**	11

[A] SCIg may be used as a replacement for IVIg for indications other than measles prophylaxis, with a dose calculated to accomplish the same effect as an IVIg dose. Doses will differ with the route of administration, but timing intervals remain the same. SCIg doses are not provided in this table.

Immune Globulin Preparations or Blood: Timing Intervals for Vaccines Containing Live Measles, Mumps, Rubella or Varicella Virus

Product	Indication	Dose and Route	Interval (months)
Specific Immune Globulin			
Botulism Immune Globlulin (**BabyBIG®**)	Infant botulism	50 mg/kg **IV**	6
Cytomegalovirus Immune Globulin (**CMVIg**)	Cytomegalovirus prophylaxis	150 mg/kg **IV**	6
Hepatitis B Immune Globulin (**HBIg**)	Hepatitis B prophylaxis	0.06 mL/kg **IM**	3
Rabies Immune Globulin (**RabIg**)	Rabies prophylaxis	20 IU/kg **IM**	4
Tetanus Immune Globulin (**TIg**)	Tetanus prophylaxis	250 units **IM**	3
Varicella Zoster Immune Globulin (**VarIg**)	Varicella prophylaxis	125 units/10 kg **IM** (max dose is 625 units)	5
Rh Immune Globulin (**RhIg**)	Postpartum for Rh negative women	300 mcg **IM**	3 [A]
Respiratory syncytial virus monoclonal antibody (**RSV Ab**; Synagis®)	Prevention of RSV disease in children under 24 months with bronchopulmonary displasia or history of premature birth etc.	15 mg/kg/4 weeks **IM**	0 [B]
Blood Transfusion Products			
Washed red blood cells		10 mL/kg **IV**	0
Reconstituted red blood cells		10 mL/kg **IV**	3
Whole blood (Hct 36%)		10 mL/kg **IV**	6
Packed red blood cells		10 mL/kg **IV**	5
Plasma/platelet products		10 mL/kg **IV**	7

[A] People who receive RhIg postpartum and are eligible for MMR and/or varicella vaccine should generally wait 3 months before being vaccinated with these vaccines. However, if there is a risk of exposure to measles, mumps, rubella, or varicella, a risk of pregnancy in the 3-month postpartum period, or a risk that vaccines may not be given later, MMR and/or varicella vaccines may be given prior to discharge with a 2nd dose at the recommended interval if indicated. If MMR and/or varicella vaccine is given within 3 months of receipt of RhIg, serologic testing for rubella and/or varicella should be done 3 months postpartum and at least 1 month after the final dose. Those who have not mounted an antibody response should be revaccinated.

[B] Respiratory syncytial virus monoclonal antibody preparation (palivizumab; Synagis®) does not interfere with the immune response to vaccines. It is routinely given every 4 weeks throughout the RSV season.