Protocol for Measles, Mumps and Rubella Containing Vaccines (M-M-R®II, PRIORIX™ and ProQuad®)

1. What's New

A. Updated to allow intramuscular administration for M-M-R® II and ProQuad.® [1,2]

2. Immunization Protocol

A. Administer a 0.5-mL dose, SQ or IM, of M-M-R® II to persons ≥7 years of age; or
B. Administer a 0.5-mL dose, SQ, of PRIORIX™ to persons ≥7 years of age; or
C. Administer a 0.5-mL dose, SQ or IM, of ProQuad® to persons ages 7-12 years.
D. May be given simultaneously with all routinely recommended vaccines. Do not give simultaneously with immune globulin.

3. Vaccine Schedule[1-3]

M-M-R®II (MMR) Dose and Route –0.5-mL SQ or IM		
PRIORIX™ (MMR) Dose and Route –0.5-mL SQ Only		
Dose	**Acceptable Age Range**	**Minimum Acceptable Spacing**
1	≥7 years	
2		28 days
ProQuad® (MMRV) Dose and Route –0.5-mL SQ or IM		
Dose	**Acceptable Age Range**	**Minimum Acceptable Spacing**
1	7-12 years	
2		3 months

4. Licensed Vaccines

Product Name	Vaccine Components	Presentation	FDA Approved Age Range	Thimerosal
M-M-R® II[1]	MMR	Single-dose lyophilized vaccine vials and 0.5-mL single-dose diluent vials	≥12 months	None
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]

A. Catch-up Vaccination: All children should routinely receive the second dose of MMR vaccine at 4–6 years of age. In Oregon, the second MMR dose is required for school attendance, beginning in kindergarten. Catch-up vaccination is recommended through age 18.
B. Students in Colleges and Universities, Healthcare Workers, International Travelers, and Household and Close Contacts of Immunocompromised Persons: Persons without evidence of immunity need two doses of MMR vaccine, at least 28 days apart.
C. Persons with HIV: Persons without evidence of current severe immunosuppression who are not immune need two doses of MMR vaccine, at least 28 days apart. MMRV is contraindicated for persons with HIV.

D. Pre- and Post-partum persons: Persons without immunity to rubella should receive MMR vaccine 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. 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.
G. 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 vaccine. Any doses given prior to 12 months of age do not count towards the two-dose series.
H. 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 vaccine.

6. Contraindications[4,5]

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

Vaccine	Contains[6]
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. Immune Globulin (IG): Do not administer MMR or MMRV simultaneously with immune globulin.[4]

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7. Warnings and Precautions

A. Moderate or severe illness, with or without fever.[7]

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]

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

   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.[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.[7]

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.		
Population	**Measles or Mumps**	**Rubella**
Routine Vaccination	• Documentation of vaccination with a live measles or mumps virus-containing vaccine: o PreK: 1 dose o K–12: 2 doses o 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: o Infants 6–11 months (measles): 1 dose o ≥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

A. Store medications according to OAR 855-041-1036.
B. 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).

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Vaccine	Temp	Storage Issues	Notes
M-M-R® II[1]	-50° to 8°C (-58° to 46°F)	Vaccine may be stored frozen. Before reconstitution, refrigerate vaccine at 2°–8°C (36°– 46°F).	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°to 8°C (36° to 46°F)	Diluent may be stored refrigerated or at room temperature.	Do not freeze.
PRIORIX™ [3]	2° to 8°C (36° to 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°to 8°C (36° to 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 72 hours before reconstitution.	Reconstituted vaccine may be stored at room temperature, protected from light, for up to 30 minutes. Do not freeze reconstituted vaccine.
ProQuad® (diluent)[2]	2°to 25°C (36° to 77°F)	Diluent may be stored refrigerated or at room temperature.	Do not freeze.

11. References

1. M-M-R®II package insert (March 2023). Available at https:/www.fda.gov/media/75191/download. Accessed 12 June 2023.
2. ProQuad® package insert (February 2023). Available at https://www.fda.gov/media/147563/download. Accessed 12 June 2023.
3. PRIORIX™ package insert (June 2022). Available at https://www.fda.gov/media/158941/download. Accessed 12 June 2023.
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 https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm. Accessed 12 June 2023.
5. 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 12 June 2023.
6. CDC. Vaccine Excipient Summary. November 2021 Available at https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/b/excipient-table-2.pdf. Accessed 12 June 2023.
7. Kroger A, Bahta L, Hunter P. General Best Practice Guidelines for Immunization. Best Practices Guidance of the Advisory Committee on Immunization Practices (ACIP), updated February 10, 2023. Available at https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html. Accessed 12 June 2023.

12. Appendix

A. Recommended intervals between administration of antibody-containing products and measles or varicella virus-containing vaccine, by product or indication for vaccination. Revised February 2021: https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/a/recommended-intervals-between-administration.pdf