**Measles, Mumps, Rubella and Varicella**

**Combination (MMRV) Vaccine**

**(ProQuad®)**

**Precautions and Contraindications**

Screen all patients for precautions and contraindications to immunization.

**Indications and Usage**

MMRV vaccine is a combination vaccine indicated for active immunization for the prevention of measles, mumps, rubella, and varicella in children aged 12 months through 12 years.

NOTE: New recommendations were adopted in June 2009 by ACIP regarding use of the combination measles, mumps, rubella, and varicella (MMRV) vaccine and were published in MMWR in May 2010. ACIP now recommends that MMR vaccine AND varicella vaccines be administered separately for the first dose in children aged 12 through 47 months due to the increased risk for febrile seizures with the MMRV combination vaccine. For the second dose of measles, mumps, rubella, and varicella vaccines at any age (i.e., 15 months through 12 years) and for the first dose in children aged 48 months through 12 years, use of the MMRV vaccine is generally preferred over separate injections of its equivalent component vaccines (i.e., MMR vaccine and varicella vaccine).

**Recommended Schedule for Measles, Mumps, Rubella, and Varicella Vaccines**

* The routinely recommended ages for measles, mumps, rubella, and varicella vaccination continue to be age 12 through 15 months for the first dose and age 4 through 6 years for the second dose.
* **FIRST DOSE** of measles, mumps, rubella, and varicella vaccines
	+ For the first dose administered to children aged 12 months through 47 months,
	MMR vaccine and varicella vaccine should be administered separately in this age group.
	+ For the first dose administered to children aged 48 months through 12 years, use of MMRV vaccine is generally preferred over separate injections of its equivalent component vaccines (i.e., MMR vaccine and varicella vaccine).
* **SECOND DOSE** of measles, mumps, rubella, and varicella vaccines
	+ For the second dose administered to children aged 15 months through 12 years, use of MMRV vaccine is generally preferred over separate injections of its equivalent component vaccines (i.e., MMR vaccine and varicella vaccine).
	+ At least one month should lapse between a dose of measles-containing vaccine, such as MMR vaccine, and a dose of MMRV vaccine. If for any reason a second dose of varicella-containing vaccine is required, at least 3 months should lapse between administrations of the two doses.

* **THIRD DOSE of** MMR vaccine.
	+ During a mumps outbreak: A third dose of MMR vaccine should be given to persons previously vaccinated with two doses of a mumps virus-containing vaccine and are identified by public health authorities as being part of a group or population at increased risk for acquiring mumps because of an outbreak
	+ MMRV vaccine, which is the other vaccine licensed in the United States for the prevention of mumps, may also be used when a third dose mumps vaccination is indicated among children aged ≤12 years.

**Dosage and Route**

* Administer 0.5 mL subcutaneously. Consult “Epidemiology and Prevention of Vaccine-Preventable Diseases” (The Pink Book), Appendix D, for information about appropriate needle sizes and needle lengths for administering vaccines.
* MMRV vaccine is supplied in single-dose vials of lyophilized vaccine to be reconstituted using only the separately packaged sterile water diluent. Withdraw the entire volume of supplied diluent into a syringe. Inject the entire content of the syringe into the vial containing the powder. Gently agitate to dissolve completely. Withdraw the entire amount of the reconstituted vaccine from the vial into the same syringe and inject the entire volume.

**Anatomical Site**

* Outer aspect of the deltoid region of the upper arm or into the higher anterolateral area of the thigh.

**Precautions**

* Prior to administering the vaccine, obtain a vaccination history to determine any reactions to any vaccine including measles, mumps, rubella or varicella;
* Pregnancy should be avoided for 3 months1 following vaccination with MMRV vaccine;
* Recent (i.e. within the preceding 11 months) receipt of antibody-containing blood product
* A history of thrombocytopenia or thrombocytopenic purpura;
* Moderate or severe acute illness with or without fever; and
* A personal or family (i.e., sibling or parent) history of seizure of any etiology.

1October 2001, the ACIP shortened its recommended period to avoid pregnancy after receipt of rubella-containing vaccine from 3 months to 28 days, <http://www.cdc.gov/vaccines/vpd-vac/combo-vaccines/mmr/faqs-mmr-hcp.htm#pregnancy>

Vaccine Information Statements (VISs) for MMR vaccine, last revised in 2018, include a precaution that “Women should avoid getting pregnant for at least 1 month after getting MMR vaccine”

Vaccine Information Statements (VISs) for varicella vaccine, last revised in 2018, include a precaution that “Women should avoid getting pregnant for at least 1 month after getting chickenpox vaccine”

Note that both the ACIP recommendations and the text of the MMR VIS and the varicella VIS differ from the package insert precautions to avoid pregnancy for three months after vaccination.

**Contraindications**

**DO NOT** administer MMRV vaccine to individuals with:

* A history of anaphylactic reaction to neomycin;
* A history of an allergic reaction to gelatin or any other component of the vaccine, or after previous vaccination with MMRV vaccine, varicella vaccine or MMR vaccine;
* Altered immunity (i.e., blood dyscrasias, leukemia, lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic systems);
* Primary and acquired immunodeficiency including HIV infections/AIDS, cellular immune deficiencies, hypogammaglobulinemia, and dysgammaglobulinemia;
* Family history of congenital or hereditary immunodeficiency, unless the immune competence of the potential vaccine recipient has been demonstrated;
* Systemic immunosuppressive therapy, including oral steroids ≥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);
* Pregnancy;
* Active untreated tuberculosis;
* Febrile illness (>101.3°F or >38.5°C);
* See package insert WARNING about administering MMRV vaccine to individuals with a history of anaphylactic or other immediate hypersensitivity reactions (e.g., hives, swelling of the mouth and throat, difficulty breathing, hypotension, or shock) after egg ingestion.

**Adverse Events**

* See the product’s package insert
* See Adverse Events Following Vaccinations page of this section

**Storage and Handling**

* Protect the vaccine from light at all times since such exposure may inactivate the vaccine viruses.
* To minimize loss of potency, MMRV vaccine should be administered immediately after reconstitution. If not used immediately, the reconstituted vaccine may be stored at room temperature, protected from light, for up to 30 minutes.
* Reconstituted MMRV vaccine, like varicella vaccine, must be discarded, if not used within 30 minutes.
* Note difference from MMR vaccine, which can be refrigerated for up to 8 hours after reconstitution.
* Please note this important recommendation: Store all live vaccines (i.e., MMR, MMRV, and varicella vaccines) in the freezer at 5°F (-15°C) or below (toprevent damaging varicella and MMRV vaccines) through inadvertent refrigeration.
* MMRV vaccine may be stored at refrigerator temperature (36° to 46°F, 2° to 8°C) for up to 72 hours prior to reconstitution. Discard any MMRV vaccine stored at 36° to 46°F which is not used within 72 hours of removal from 5°F (-15°C) storage**.**

**Other Important Notes**

**Tuberculin Testing and Live Vaccines**

Recommendations for use of the tuberculin skin test are independent of those for immunization. Tuberculin testing at any age is not required before administration of live-virus vaccines. A tuberculin skin test (TST) can be applied at the same visit during which these vaccines are administered. Measles vaccine temporarily can suppress tuberculin reactivity for at least 4 to 6 weeks. The effect of live-virus varicella, yellow fever, and live-attenuated influenza vaccines on tuberculin skin test reactivity is not known. In the absence of data, the same TST spacing recommendation should be applied to these vaccines as described for MMR. There is no evidence that inactivated vaccines, polysaccharide vaccines or recombinant or subunit vaccines or toxoids interfere with immune response to TST.

**Tuberculin Skin Testing (TST) and Measles, Mumps, Rubella, Varicella Vaccine (MMRV)**

* Apply TST at same visit as MMRV (preferred strategy)
* Apply TST first and administer MMRV when TST is read (least favored option because receipt of MMRV is delayed) (least preferred strategy)
* Delay TST at least 4 weeks if MMRV is given first.

**Resources**

Marin M, Marlow M, Moore K, Patel M. Recommendation of the Advisory Committee on Immunization Practices for Use of a Third Dose of Mumps Virus–Containing Vaccine in Persons at Increased Risk for Mumps During an Outbreak. MMWR Morb Mortal Wkly Rep 2018;67:33–38, <https://cdc.gov/mmwr/volumes/67/wr/mm6701a7.htm>

Advisory Committee on Immunization Practices (ACIP) Resolution No. 10/17-3: Vaccines to Prevent Measles, Mumps, Rubella, and Varicella,

[www.cdc.gov/vaccines/programs/vfc/providers/resolutions.html](http://www.cdc.gov/vaccines/programs/vfc/providers/resolutions.html).

Vaccine Information Statement. MMR (Measles, Mumps, Rubella, and Varicella) Vaccine: *What You Need to Know.*  Centers for Disease Control and Prevention. Last revised 2/12/2018,
<https://www.cdc.gov/vaccines/hcp/vis/vis-statements/mmrv.pdf> .

Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, U.S., 2018, <https://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html>

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