OREGON HEALTH AUTHORITY
IMMUNIZING PHARMACIST PROTOCOL

MEASLES, MUMPS AND RUBELLA LIVE VIRUS VACCINE **MEASLES, MUMPS, RUBELLA AND VARICELLA LIVE VIRUS VACCINE**	
Last Reviewed	21 March 2019
Last Revised	21 March 2019
This order expires	31 July 2021

Addition of MMR recommendations for Individuals with HIV: Section IV. D–F.[8]
Addition of Measles Outbreak guidance, Section II C. Table 3.

- For clients ≥7 years of age with only 1 previous dose; give 1 dose at least 28 days after the previous dose.
- Vaccinate health-care personnel, **regardless of birth year**, who do not have:
  - laboratory evidence of measles, rubella, and mumps immunity;
  - laboratory confirmation of disease; or
  - documentation of vaccination with 2 appropriately spaced doses of MMR vaccine.[8]
- If the outbreak affects preschool-aged children or adults with community-wide transmission, give a second dose upon request to adults who have received 1 dose.

Addition of Mumps Outbreak guidance[3] Section II D. Table 4.

- For clients with only 1 previous dose; give 1 dose.
- For clients with 2 previous doses; give 1 dose if it has been >5 years since the last dose recorded in ALERT or >1 month since the last ‘stated’ dose.
- Do not give more than a total of 3 doses.

New IG table Section VII B.

I. OREGON IMMUNIZATION PHARMACY PROTOCOL:

1. Check the ALERT Immunization Information System (IIS) to determine whether the patient needs this vaccine and any other vaccines.
2. Screen clients ≥7 years of age for contraindications.
3. Provide a current Vaccine Information Statement (VIS), and answer any questions.
4. Record all required data elements in the client's permanent health record.
5. Both client and vaccinator must be seated for vaccine administration.
6. Give MMR or MMRV SQ:
   a) If not given simultaneously with another live virus vaccine, give at least 28 days apart.
   b) If a PPD tuberculin skin test is not given simultaneously with a MMR-containing vaccine, delay PPD for at least 4 weeks.
7. May be given with all ACIP-recommended child and adult vaccinations.
8. Observe client for 15 minutes after vaccination to decrease the risk for injury should they faint.

Immunizing Pharmacist Date

Note: Single antigen varicella and live zoster under separate order

II. A. Table 1. VACCINE SCHEDULE FOOTNOTES FOR MEASLES-MUMPS-RUBELLA (MMR)

Vaccine Schedule for Measles-Mumps-Rubella (MMR) SQ[1]			
DOSE	**MINIMUM AGE**	**MINIMUM SPACING**	**Recommended Age**
1	≥7 years of age		≥7 years of age
2	≥7 years of age	28 days	≥7 years of age

1. Two or more injectable or nasally administered **live vaccines** not administered on the same day should be separated by at least 4 weeks, to minimize the potential risk for interference. If 2 such vaccines are separated by <4 weeks, the second vaccine administered should not be counted and the dose should be repeated at least 4 weeks later. On the day a live injectable or intranasal vaccine will be administered, providers should ensure that no live injectable or intranasal vaccine was given in the previous 28 days.
   The 4-day grace period should not be applied to this 4-week interval between 2 different live vaccines.[6]
2. When an invalid dose needs to be repeated, the repeat dose should be spaced after the invalid dose by at least 28 days.[6]
3. Accept MMR #2 at any age when MMR #1 was given on or after the first birthday and MMR #2 was given at least 28 days later.[5]
4. Oregon Administrative Rules (OAR) require a second measles-containing vaccine for students in grades K–12, college students, and community college students involved in clinical experiences in allied health programs, practicum experiences in education and child care programs and membership on intercollegiate sports teams, unless a valid exemption is in place.[7]

II. B. Table 2. VACCINE SCHEDULE FOOTNOTES FOR MEASLES MUMPS RUBELLA AND VARICELLA (MMR–V)

Vaccine Schedule for Measles Mumps Rubella and Varicella (MMRV) SQ[2]				
Dose	**Preferred Age***	**Maximum Age§**	**Minimum Acceptable Age**	**Minimum Acceptable Spacing**
1	≥7 years	12 years	≥7 years	
2◊				28 days

* For the second dose of measles, mumps, rubella, and varicella vaccines (7–12 years) and for the 1st dose at age ≥7 years, use of MMRV generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events.[7]

◊MMRV may be used in children 7–12 years of age if a second dose of measles, mumps and rubella vaccine is to be administered and if no MMR is available at the time the second dose of MMR is indicated.[6]

§If MMRV is inadvertently given to a patient age 13 years and older, it may be counted towards completion of the MMR and varicella vaccine series and does not need to be repeated. http://www.immunize.org/askexperts/experts_combo.asp [9]

II.C. Table 3. VACCINATION SCHEDULE FOR MEASLES OUTBREAK ONLY

Dose	Preferred Age	Minimum Acceptable Age	Minimum Acceptable Spacing from last dose
MMR II Dose 1	≥12 months	≥6 months	
MMR II® Dose 2 or 3			28 days

MMR is only likely to work as post-exposure prophylaxis if given within 72 hours of exposure. However, unvaccinated people should get vaccinated even if it is >72 hours post exposure.

If the outbreak affects preschool-aged children or adults with community-wide transmission, a second dose may be given upon parental request to children aged 1 through 4 years, or to requesting adults who have received 1 dose.

In addition, during measles outbreaks involving infants aged <12 months with ongoing risk for exposure, infants aged ≥6 months can be vaccinated upon parental request.

If there is measles in a school or other group with low vaccination rates, measles vaccination may be given to infant siblings of potentially exposed persons.

II.D. Table 4. VACCINATION SCHEDULE FOR MUMPS OUTBREAK ONLY [4]

DOSE 2 or 3 For Outbreaks Only	Preferred Age	Minimum Acceptable Age	Minimum Acceptable Spacing from last dose	Maximum Age
MMR II® Dose 2 or 3	≥7 years	≥7 years	≥1 month from stated dose if there are no doses in ALERT or 5 years from the last dose documented in ALERT	
ProQuad® Dose 2 or 3	≥7 years	≥7 years		12 years

- For clients with only 1 previous dose: give 1 dose.
- For clients with 2 previous doses: give 1 dose if it has been >5 years since the last dose recorded in ALERT or >1 month since the last 'stated' dose.
- Do not give more than a total of 3 doses.

During an outbreak, an additional dose of vaccine should be considered for all persons ≥12 months of age that are affected by the outbreak and whose only evidence of immunity is documentation of a previous dose(s) of vaccine.

III. Table 5. LICENSED VACCINE

A. LICENSED COMBINATION MMR VACCINE[1]			
Product Name	**Vaccine Components**	**Acceptable Age Range**	**Thimerosal**
M-M-R® II* (Merck)	Measles◊ Mumps§ Rubella‡	≥7 years‡‡	No
B. LICENSED COMBINATION MMR AND VARICELLA (MMRV) VACCINE[2]			
ProQuad®◊◊,§§ (Merck)	Measles◊ Mumps§ Rubella‡ Varicella**	≥7 years –12 years	No

* Each dose contains approximately 25 mcg of neomycin. The product contains no preservative. Sorbitol and hydrolyzed gelatin are added as stabilizers.

◊ M-M-R® II contains a sterile, lyophilized preparation of ATTENUVAX®, a more attenuated line of measles virus, derived from Enders' attenuated Edmonston strain and grown in cell cultures of chick embryo.

§ MUMPSVAX®, the Jeryl Lynn strain of mumps virus, is grown in cell cultures of chick embryo.

‡ MERUVAX®, the Wistar RA 27/3 strain of live attenuated rubella virus, is grown in human diploid cell culture.

** Oka/Merck strain of varicella-zoster virus propagated in MRC-5 cells.

◊◊ MMRV vaccine must be stored frozen at an average temperature ≤ 5°F (≤ 15°C) and the diluent should be stored separately at room temperature.

§§ MMRV, like Varicella vaccine, must be given within 30 minutes of reconstitution.

IV. RECOMMENDATIONS FOR USE[8]

A. All persons ≥ 7 years of age of age without medical contraindications (e.g., pregnancy or severe immunosuppression), who

- **do not have acceptable evidence of immunity to measles, mumps, and rubella (see section IV); or**
- **college students or medical care workers who have "acceptable evidence of immunity to measles" but nevertheless are required by schools or employers to be vaccinated[*] should be vaccinated with MMR**

B. Post-partum women who do not have evidence of immunity to rubella should receive MMR vaccine upon completion or termination of pregnancy. Postpartum administration of MMR vaccine to women who lack presumptive evidence of immunity to rubella should not be delayed because anti- Rho(D) IG (human) or any other blood product were received during the last trimester of pregnancy or at delivery. These women should be vaccinated immediately after delivery and tested at least 3 months later to ensure that they have presumptive evidence of immunity to rubella and measles.

C. Indications for repeating a dose of measles vaccine

- Vaccination before the first birthday;
- Vaccination <28 days after another live vaccine (e.g. FluMist®)
- Vaccination with killed measles vaccine,
- Vaccination with killed measles vaccine followed by live vaccine less than 4 months after the last dose of killed measles vaccine.
- Vaccination before 1968 with an unknown type of vaccine.
- Vaccination with IG in addition to a vaccine of unknown type. (Revaccination not necessary if IG given with Edmonston B vaccine.)

[*]Per OIP medical director.
[◊]An outbreak is determined and guided by the epidemiology and the setting of the outbreak.

D. MMR recommendations for individuals with HIV:

- Two doses of MMR are recommended for all persons aged ≥12 months with HIV infection who do not have evidence of measles, rubella, and mumps immunity or who do not have evidence of current severe immunosuppression, but not MMR**V** vaccine. MMR**V** is contraindicated in individuals with HIV.

- Recommend revaccination of persons with perinatal HIV infection who were vaccinated before establishment of effective antiretroviral therapy (ART) with 2 appropriately spaced doses (i.e., 1 dose now and another dose at least 28 days later) once effective ART has been established unless they have other acceptable current evidence of measles, rubella, and mumps immunity.

- The first dose of MMR vaccine should be administered at age 12 through 15 months and the second dose at age 4 through 6 years, or as early as 28 days after the first dose.

- Older children and adults with newly diagnosed HIV infections and without acceptable evidence of measles, rubella, or mumps immunity (Table 6) should complete a 2-dose schedule with MMR vaccine as soon as possible after diagnosis, unless they have evidence of severe immunosuppression.

E. MMR contraindications for individuals with HIV:[8]

- persons with primary or acquired immunodeficiency, including persons with immunosuppression associated with cellular immunodeficiencies, hypogammaglobulinemia, dysgammaglobulinemia and AIDS or severe immunosuppression associated with HIV infection;
- persons with blood dyscrasias, leukemia, lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic system;
- persons who have a family history of congenital or hereditary immunodeficiency in first-degree relatives (e.g., parents and siblings), unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory; or
- 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 .

F. Definitions:[8]

Absence of severe immunosuppression: is defined as CD4 percentages ≥15% for ≥6 months for persons aged ≤5 years and CD4 percentages ≥15% and CD4 count ≥200 lymphocytes/mm3 for ≥6 months for persons aged >5 years. When only CD4 counts or CD4 percentages are available for those aged >5 years, the assessment of severe immunosuppression can be on the basis of the CD4 values (count or percentage) that are available. When CD4 percentages are not available for those aged ≤5 years, the assessment of severe immunosuppression can be on the basis of age-specific CD4 counts at the time CD4 counts were measured (i.e., absence of severe immunosuppression is defined as ≥6 months above age-specific CD4 count criteria: CD4 count >750 lymphocytes/mm3 while aged ≤12 months and CD4 count ≥500 lymphocytes/mm3 while aged 1 through 5 years).

Established effective ART: [8] is defined as receiving ART for ≥6 months in combination with CD4 percentages ≥15% for ≥6 months for persons aged ≤5 years and CD4 percentages ≥15% and CD4 count ≥200 lymphocytes/mm3 for ≥6 months for persons

aged >5 years. When only CD4 counts or only CD4 percentages are available for those aged >5 years, the assessment of established effective ART can be on the basis of the CD4 values (count or percentage) that are available. When CD4 percentages are not available for those aged ≤5 years, the assessment of established effective ART can be on the basis of age-specific CD4 counts at the time CD4 counts were measured (i.e., established effective ART is defined as receiving ART for ≥6 months in combination with meeting age-specific CD4 count criteria for ≥6 months: CD4 count >750 lymphocytes/mm3 while aged ≤12 months and CD4 count ≥500 lymphocytes/mm3 while aged 1 through 5 years).

IV.D. Table 6. ACCEPTABLE EVIDENCE OF IMMUNITY[8]

For routine purposes, persons who meet the criteria below are considered immune to Measles, Mumps, or Rubella, respectively		
	Measles or Mumps	Rubella
Routine Vaccination	1.Documentation of age-appropriate vaccination with a live measles or mumps virus-containing vaccine*: -preschool-aged children: 1 dose -school-aged children, K-12: 2 doses -adults not at high risk[5]: 1 dose, or 2.Laboratory evidence of immunity◊, or 3.Laboratory confirmation of disease, or 4.Born before 1957	1.Documentation of vaccination with 1 dose of live rubella virus-containing vaccine*, or 2.Laboratory evidence of immunity◊, or 3.Laboratory confirmation of disease, or 4.Born before 1957 (except women of childbearing age who could become pregnant‡)
Students at post-high school educational institutions	1.Documentation of vaccination with 2 doses of live measles or mumps virus-containing vaccine*, or 2.Laboratory evidence of immunity◊, or 3.Laboratory confirmation of disease, or 4.Born before 1957	1.Documentation of vaccination with 1 dose of live rubella virus-containing vaccine*, or 2.Laboratory evidence of immunity◊, or 3.Laboratory confirmation of disease, or 4.Born before 1957 (except women of childbearing age who could become pregnant[4])
International Travelers, Healthcare Personnel[5], High-risk adults	1.Documentation of age-appropriate vaccination with a live measles or mumps virus-containing vaccine: Measles: infants 6–11 months§: 1 dose Measles or Mumps: persons age ≥12 months◊: 2 doses, or 2.Laboratory evidence of immunity, ◊ or 3.Laboratory confirmation of disease, or 4.Born before 1957.	1.Documentation of vaccination with 1 dose of live rubella virus-containing vaccine, * or 2.Laboratory evidence of immunity, ◊ or 3.Laboratory confirmation of disease, or 4.Born before 1957 (except women of childbearing age who could become pregnant‡)

* The first dose of MMR vaccine should be administered on or after age 12 months; the second dose of measles- or mumps- containing vaccine should be administered no earlier than 28 days (minimum spacing) after the first dose.[8]

◊ Measles, rubella, or mumps immunoglobulin (IgG) serum; equivocal results should be considered negative.[8]

§ Children who receive a dose of MMR vaccine before age 12 months should be revaccinated with 2 doses, the first of which should be administered when the child is aged 12-15 months (12 months if the child remains in a high-risk area) and the second at least 28 days later.[8]

‡ All women of childbearing age (i.e., adolescent girls and premenopausal adult women), especially those who grew up outside the United States in areas where routine rubella vaccination might not occur, should be vaccinated with 1 dose of MMR vaccine or have other acceptable evidence of rubella immunity. Nonpregnant women of childbearing age who do not have documentation of rubella vaccination, serologic evidence of rubella immunity, or laboratory confirmation of rubella disease should be vaccinated with MMR vaccine. Birth before 1957 is not acceptable evidence of rubella immunity for women who could become pregnant. Because rubella can occur in some persons born before 1957 and because congenital rubella and congenital rubella syndrome can occur in the offspring of women infected with rubella virus during pregnancy, birth before 1957 is not acceptable evidence of rubella immunity for women who could become pregnant. Women of childbearing age who have received 1 or 2 doses of rubella-containing vaccine and have rubella serum IgG levels that are not clearly positive should be administered 1 additional dose of MMR vaccine (maximum of 3 doses) and do not need to be retested for serologic evidence of rubella immunity.[8]

V. CONTRAINDICATIONS

1. **History of anaphylactic reactions to neomycin**; does not include contact dermatitis.[8]
2. **History of severe allergic reaction to any component of the vaccine**. Allergy to egg is not a contraindication. There is no need for prior routine skin testing or use of special protocols. [8]
3. **Pregnancy**; do not give to pregnant women. Women should be counseled to avoid becoming pregnant for 28 days after receipt of MMR vaccine. Close contact with a pregnant woman is not a contraindication. [8]
4. **Immunosuppression**:

   a.) See HIV section for specifics.

   b.) persons with blood dyscrasias, leukemia, lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic system;

   c.) persons who have a family history of congenital or hereditary immunodeficiency in first-degree relatives (e.g., parents and siblings), unless the immune competence of the potential vaccine recipient has been substantiated clinically or verified by a laboratory; or

   d.) 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. [8,10,12]

5. **Immune Globulin (IG) and MMR-containing vaccines should not be administered simultaneously:**
   a) If IG is given before MMR or MMRV, consult the table in Sect. VIII for the appropriate interval.
   b) If the live vaccine* is given first, it is necessary to wait at least 2 weeks (i.e., an incubation period) before giving the antibody. [8]
   c) If the interval between the vaccine and antibody is less than 2 weeks, the recipient should be tested for immunity or the vaccine dose should be repeated.[6]

VI. WARNNGS AND PRECAUTIONS

1. **Recent (≤11 months) receipt of antibody-containing blood Product:** 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. The effect of IG-containing preparations on the response to mumps vaccine is unknown. [8]
2. **Salicylates:** Avoid use of salicylates for 6 weeks after varicella vaccine[2]
3. **Defer MMR-containing vaccine during moderate or severe illness with or without fever.** [8]
4. **History of thrombocytopenia or thrombocytopenic purpura** or low platelet counts at time of injection may be at increased risk for clinically significant thrombocytopenia following a MMR-containing vaccine. If a patient experiences an episode of thrombocytopenia within 6 weeks after receiving an MMR-containing vaccine, consult with client's physician before giving subsequent doses. Serologic testing for measles and varicella immunity may be prudent prior to administration of either vaccine. [8]
5. **Tuberculosis:** Vaccination in persons with active tuberculosis should be deferred until they have recovered. There is a theoretical concern that measles vaccine might exacerbate tuberculosis. [8]
6. **Tuberculin testing:** if a tuberculin skin test is to be performed, it should be administered either any time before, simultaneously with, or at least 4–6 weeks after MMR or MMRV vaccine. As with the tuberculin skin tests, live virus vaccines also might affect tuberculosis interferon-gamma release assay (IGRAs) blood test results. [8]
7. **Personal or family history of seizures of any etiology:** Studies suggest that children who have a personal or family history of febrile seizures or epilepsy are at increased risk for febrile seizures compared with children without such histories. In one study, the risk difference of febrile seizure within 14 days of MMR vaccination for children aged 15 to 17 months with a personal history of febrile seizures was 19.5 per 1,000 (CI = 16.1– 23.6) and for siblings of children with a history of febrile seizures was four per 1,000 (CI = 2.9–5.4) compared with unvaccinated children of the same age. [8]

VII. A. OTHER CONSIDERATIONS

1. **Adverse Events**: epinephrine hydrochloride solution (1:1,000) and other appropriate agents and equipment must be available for immediate use in case of anaphylactic or acute hypersensitivity reaction.[6]
2. **Arthralgia and arthritis:** arthralgia develops among approximately 25% of nonimmune postpubertal females after vaccination with rubella RA 27/3 vaccine, and approximately 10% to 30% have acute arthritis-like signs and symptoms. Arthralgia or arthritis generally begin 1–3 weeks after vaccination, usually are mild and not incapacitating and persist 1 day to 3 weeks, and rarely recur.[9]
3. **Penicillin allergy** is not a contraindication for MMR or MMRV.[6]
4. **Breastfeeding** is not a contraindication to MMR-containing vaccine for the woman or the breast-feeding child.[6]
5. **Serologic screening:** For unvaccinated persons who work within medical facilities, serologic screening need not be done before vaccinating for measles, mumps and rubella unless the medical facility considers it cost-effective. [8]
6. **Healthcare workers:** Healthcare students born after January 1, 1957 with no history of disease, no history of immunization, or a negative serology for measles should receive a two-dose series of MMR vaccine. [8]
7. **Documented Immunity:** Individuals with laboratory documentation of immunity to all three MMR viruses need not be vaccinated. [8]
8. **Internationally adopted children:** Vaccination of internationally adopted children: The simplest approach to resolving concerns regarding MMR immunization is to revaccinate with one or two doses of MMR depending on the child's age. Alternatively, serologic testing for IgG antibody to vaccine viruses indicated on the vaccine record can be considered. Consult CDC General Recommendations on Immunization for further clarification regarding serologic follow-up, page 34.[6]
9. **Chemotherapy** patients who have not received chemotherapy for at least three months may receive live virus vaccine. Provider approval required.[6]
10. **Hematopoietic Stem Cell Transplant (HSCT) Per ACIP MMR and IDSA**: vaccine should be administered 24 months after transplantation if the HSCT recipient is presumed to be immunocompetent. Since adults who experience natural measles infection prior to transplantation usually retain immunity for several years after HSCT, it is recommended that a measles serology be performed, with vaccination of only seronegative patients. If a decision is made by transplant's provider to vaccinate with varicella vaccine, the vaccine should be administered a minimum of 24 months after transplantation.[8, 10]
11. **Protection of Contacts and Outbreak Control:**

- See the Oregon Disease Investigative Guidelines for measles, mumps and rubella. (http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/ReportingCommunicableDisease/ReportingGuidelines/Pages/index.aspx) Accessed 06 June 2018.
- Although mumps vaccine may not provide post-exposure protection, it may protect against subsequent exposures. [13]

- There is no evidence of increased risk for vaccine-associated adverse events if mumps vaccine is given while disease is incubating.

12. **Persons who lack evidence of immunity** to any of the three viruses in MMR are eligible for MMR. Give 2 doses at least 28 days apart. [8]
13. **IG has not been of any value** after exposure to either mumps or rubella. Such use is not recommended. [8, 12]
14. **Rubella vaccine** has not been of any value after exposure to rubella. [8, 12]
15. **Exclusion of susceptibles** in schools or day-care settings:
A susceptible child in a school or children's facility who has been exposed to a restrictable disease that is also a reportable disease for which an immunization is required under Oregon Administrative Rule 333-050-0050 must be excluded by the school administrator, unless the local health officer determine, that exclusion is not necessary to protect the public's health. See Oregon Administrative Rule 333-019-0010(3).
    - Measles: exclude susceptibles for 21 days after the last date of attendance of the last case.
    - Mumps: exclude susceptibles for 26 days after the onset of parotitis in the last case.[13]
    - Rubella: exclude susceptibles for 23 days after the last date of attendance of the last case.

VII. B. Table 7. SUGGESTED INTERVALS BETWEEN ADMINISTRATION OF IMMUNE GLOBULIN PREPARATIONS AND MEASLES- OR VARICELLA-CONTAINING VACCINE[5]

Product/Indication	**Dose (mg IgG/kg) and route[a]** This table is not intended for determining the correct indications and dosages for using antibody-containing products	**Recommended interval before measles- or varicella-containing vaccine[b] administration (months)**
Blood transfusion		
RBCs, washed	10 mL/kg, negligible IgG/kg IV	None
RBCs adenine-saline added	10 mL/kg (10mg IgG/kg) IV	3
Packed RBCs (hematocrit 65%)[c]	10 mL/kg (60mg IgG//kg) IV	6
Whole blood (hematocrit 35%–50%) [c]	10 mL/kg (80-100 mg IgG/kg) IV	6
Plasma/platelet products	10 mL/kg (160mg IgG/kg) IV	7
Botulinum Immune Globulin IV (Human)	1.0 mL.kg (50mg IgG/kg) IV	6
Cytomegalovirus IGIV	150 mg/kg maximum IV	6
Hepatitis A[1]		
Contact prophylaxis	0.1 mL/kg (3.3 mg IgG/kg) IM	3
International travel up to 1 month	0.1 mL/kg (3.3 mg IgG/kg) IM	3
International travel up to 2 months	0.2 mL/kg (10mg IgG/kg) IM	3
International travel >2 months	0.2 ml/kg (10mg IgG/kg) IM Repeat 0.2 mL/kg every 2 months IM	3

Hepatitis B IG	0.06 mL/kg (10mg IgG/kg) IM	3
IG IV		
Replacement therapy for immune deficiencies[d]	300-400 mg/kg IV[d]	8
Immune thrombocytopenic purpura treatment	400 mg/kg IV	8
Postexposure varicella prophylaxis	400 mg/kg IV	8
Postexposure measles prophylaxis for **immunocompromised** contacts	400 mg/kg IV	8
Immune thrombocytopenic purpura treatment	1000 mg/kg IV	10
Kawasaki disease	2 g/kg IV	11
Measles prophylaxis IG		
Standard (i.e., nonimmunocompromised) contact	0.50 mL/kg (80 mg IgG/kg) IM	6
Monoclonal antibody to respiratory syncytial virus F protein (e.g., Synagis [MedImmune])[e]	15 mg/kg IM	None
Rabies IG	20 IU/kg (22 mg IgG/kg) IM	4
Tetanus IG	250units (10 mg IgG/kg) IM	3
Varicella IG	125 units/10 kg (60-200 mg IgG/kg) IM, maximum 625 units	5

Footnotes:[5]

Table 3-5, page 37-39, June 2018:

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.

(b) Does not include zoster vaccine. Zoster vaccine may be given with antibody-containing blood products.

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

(d) 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, but both are contraindicated for persons with severe immunosuppression from HIV or any other immunosuppressive disorder.

(e) Contains antibody only to respiratory syncytial virus.

VII. C. VACCINATION OF PERSONS WITH IMMUNOSUPPRESSION

1. Who do not have evidence of current severe immunosuppression[8]
    - Age 12 months: CD4 % ≥ 15% for ≥ 6 months
    - Age > 5 years: CD4% ≥15 for ≥ 6 months AND ≥ 200 / mm^3 for ≥ 6 months
2. And do not have other evidence of measles, rubella, and mumps immunity:
    - Two doses of MMR vaccine for all persons aged ≥ 12 months[8]
    - The first dose should be administered at age 12 – 15 months and the second dose at age 4 – 6 years, or as early as 28 days after the first dose.[12]
    - Persons with perinatal HIV infection who were vaccinated prior to establishment of effective Anti-Retroviral Therapy (ART) should receive two appropriately spaced doses of MMR vaccine once effective ART has been established. [8]
    - MMRV is NOT recommended for persons with HIV infection regardless of degree of immunosuppression because it has not been studied in this population.[8,10,12]
3. MMR-containing vaccine may be considered for persons with leukemia in remission if at least 3 months have passed since termination of chemotherapy (Consult with patient's oncologist).[10]
4. A large dose of corticosteroids is considered equivalent to prednisone ≥2 mg/kg/day or ≥20 mg/day either given daily or every other day for ≥14 days. An isolated treatment ≥2 mg/kg/day or ≥20 mg/day either given daily or every other day for ≤14 days, is permitted. Treatment with <2 mg/kg/day, alternate-day, topical, replacement, or aerosolized, or tendon bursal injection steroid preparations is not a contraindication to an MMR-containing vaccine.[4]
5. MMR-containing vaccines should be avoided for at least 1 month after cessation of high-dose steroid treatment.[4]

VIII. Table 8. SIDE EFFECTS AND ADVERSE EVENTS[2]

Number followed for Safety Age in Years	MMR® II and Varivax® Study Number N =1997 Adverse Reaction % 12–23 months	ProQuad® Study Number N=4224 Adverse Reaction % 12–23 months
Local Reaction, Injection site		
Pain	26.7	22.0
Redness	15.8	14.4
Swelling	9.8	8.4
Ecchymosis	2.3	1.5
Rash	1.5	2.3
Systemic Complaints		
Fever ≥102°F	14.9	21.5
Irritability	6.7	6.7
Measles-like rash	2.1	3.0
Varicella-like rash	2.2	2.1
Rash not otherwise specified	1.4	1.6
Upper respiratory infection	1.1	1.3
Viral exanthema	1.1	1.2
Diarrhea	1.3	1.2
Table 1, pages 5 and 6		

IX. Table 9. 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	Latex	Temp	Storage Issues	Notes
M–M–R®II[1]	No	Store at -50°C–+8°C (-58˚F–+46˚F) **OR** Store at 2°–8°C (36˚F–46˚F)	Protect from light at all times Diluent may be stored in refrigerator or at room temperature (do not freeze diluent).	**Use immediately** after reconstitution. If not, may store in a dark place at 2°–8°C (36˚F–46˚F) and **discard within 8 hours**.
ProQuad®[2]		Store at -50°C–-15°C (-58˚F–+5˚F)	Do not use dry ice. Diluent may be stored in refrigerator or at room temperature (do not freeze diluent). ProQuad® vaccine powder may be stored at refrigerator temperature for up to 72 hours prior to reconstitution. Discard any ProQuad® vaccine powder stored at 36˚F–46˚F which is not used in 72 hours of removal from 5°F (-15°C) storage.	**If not used immediately** may be stored at room temperature and protected from light for up to 30 minutes. **Discard vaccine if** not used within 30 minutes of reconstitution. **Do not freeze reconstituted vaccine**

X. ADVERSE EVENTS REPORTING

Private providers are to report events directly to VAERS and can read about options on how to do so at https://vaers.hhs.gov/reportevent.html

A pharmacist who administers any vaccine must report the following elements to the OHA ALERT Immunization Information System in a manner prescribed by OHA within 15 days of administration. This replaces the former requirement to notify the primary health care provider. A pharmacist is not required to notify the primary health care provider. Oregon Administrative Rule 855-019-0290-(2)(3).[14]

Electronic copy of this standing order is available at: 1.usa.gov/PharmacyImmunizationProtocols

Table 10. VAERS Reporting Table*: https://vaers.hhs.gov/docs/VAERS_Table_of_Reportable_Events_Following_Vaccination.pdf

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

	immunodeficient recipient Vaccine-strain virus identified (interval - not applicable) If strain determination is not done or if laboratory testing is inconclusive (12 months) Any acute complications or sequelae (including death) c above events (interval - not applicable) Events described in manufacturer's package insert as contraindications to additional doses of vaccine (interval - see package insert)

Effective date: March 21, 2017. The Reportable Events Table (RET) reflects what is reportable by law (42 USC 300aa-25) to the Vaccine Adverse Event Reporting System (VAERS) including conditions found in the manufacturer package insert. In addition, healthcare professionals are encouraged to report any clinically significant or unexpected events (even if not certain the vaccine caused the event) for any vaccine, whether or not it is listed on the RET.

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