INFORMATION PAPER

Military Vaccine Agency
1 March 2007

SUBJECT: Rubella Infection and Rubella Vaccine

1. Purpose. To describe rubella disease and the vaccine to prevent it.

2. Facts.

a. Microbiology. Rubella virus is a togavirus, genus rubivirus. Rubella is a mild but highly contagious viral infection characterized by low-grade fever, swollen lymph nodes, rash, and joint pain in adults. Symptoms may be mild, and up to 50% of infections may be without noticeable symptoms. Rubella infection in early pregnancy can lead to birth defects that may result in fetal death, spontaneous abortion, or premature delivery. Rubella is also known as “three-day measles” or “German measles.” Avoid using these nicknames to avoid confusion with measles, which is a different viral infection.

b. Epidemiology. Rubella is spread from person-to-person via airborne respiratory droplets from coughing or sneezing. Reported cases (57,686) peaked in the United States in 1969, before rubella vaccine became available. By 2002, only 18 cases were reported. Due to vaccination the Centers for Disease Control no longer consider rubella a major public health threat in the US. However, maintaining high vaccine coverage through continued routine vaccination of children and adults is important to prevent a resurgence of this disease.

c. Vaccine. The rubella vaccine now licensed in the United States contains live attenuated (weakened) viruses grown in WI-38 human diploid cells. The vaccine contains no duck, chicken, or egg proteins. It can be packaged alone (*Meruvax-II*, Merck), or combined with both measles and mumps vaccines in a trivalent form known as MMR (*M-M-R-II*, Merck). The vaccine is equally effective and safe in any of the combinations. In recent years, Merck distributes only MMR in the United States. The Food & Drug Administration licensed Merck to produce monovalent rubella vaccine in 1969 and MMR in 1971 (with formulation improvements to both products in 1979). Recently, MMR has been combined with varicella (chickenpox) vaccine (*ProQuad, Merck*). Both *M-M-R- II and ProQuad* contain small amounts of egg protein, neomycin and gelatin.

d. Immunization. MMR is given subcutaneously as a 0.5-mL dose. Give children the first dose at 12 to 15 months of age and the second dose at 4 to 6 years of age. Also give MMR to children who have not received the second dose by the 11- to 12-year-old visit. *ProQuad* can replace one or both doses of *MMR-II* where varicella vaccination is also required. Allow at least 4 weeks between the first and second dose. Adults born before 1957 are assumed to be immune to mumps by natural infection. Give adults born in 1957 or later who do not have medical restrictions at least one dose of MMR vaccine during their lifetime. Give two lifetime doses of MMR vaccine to certain adults born in 1957 or later, including healthcare workers, those who travel overseas, or those who attend post-secondary educational institutions. A second dose of MMR is also recommended for adults who have been recently exposed to measles or who are in an outbreak setting, were previously vaccinated with killed measles vaccine, were vaccinated with an unspecified measles vaccine between 1963 and 1967, or plan to travel internationally.

e. Cautions. The following people should not receive mumps or MMR vaccine: people with severe hypersensitivity to the vaccine or its components, pregnant women or women who are considering pregnancy within the next month, people who are immune suppressed, people with moderate to severe acute illnesses, and people with severe allergies to gelatin or neomycin. The American Academy of Pediatrics has stated that, "Most children with a history of anaphylactic reactions to eggs have no untoward reactions to measles or MMR vaccine. Persons are not at increased risk if they have egg allergies that are not anaphylactic, and they should be vaccinated in the usual manner." People with severe allergies to eggs, where it is decided the risk of vaccination with MMR exceeds the potential benefit, can be safely vaccinated with monovalent rubella vaccine (*Meruvax-II*, Merck).

f. Adverse Events. The most common adverse reactions after MMR are fever and rash, which are usually caused by the measles vaccine component. Inflammation of the parotid gland is rare after vaccination and is caused by the mumps vaccine component. Temporary swelling of lymph nodes sometimes occurs after vaccination and is most likely related to the rubella vaccine component. Joint aches or inflammation is reported in up to 25% of rubella-susceptible post-pubertal women who receive MMR or other rubella-containing vaccine.

g. DoD Policy. MMR is administered to all basic trainees and other accessions, unless they have positive blood tests to all three components or documented evidence of two prior vaccinations. For personnel whose records show receipt of an older bivalent measles-rubella vaccine, vaccination with MMR against mumps is not a military requirement but may be appropriate in some clinical circumstances. For other adults and children, DoD follows guidelines of the Advisory Committee on Immunization Practices (ACIP). In general, ACIP prefers use of MMR to monovalent or bivalent vaccines because it provides immunity to all three diseases.

3. References.

a. Advisory Committee on Immunization Practices (ACIP). Measles, mumps, and rubella: Vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps. MMWR 1998;47(RR-8):1-57.
http://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4708.pdf

b. CDC disease information. www.cdc.gov/ncidod/diseases/submenus/sub_rubella.htm

c. Multiple resources (e.g., product insert, Vaccine Information Statements) assembled by Military Vaccine Agency: www.vaccines.mil/rubella

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