

## INFORMATION PAPER

Military Vaccine Agency  
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SUBJECT: Mumps Infection and Mumps Vaccine

1. Purpose. To describe mumps and the vaccine to prevent it.

2. Facts.

a. Microbiology. Mumps virus is a paramyxovirus that causes an acute infectious disease that attacks glandular and nervous tissue. Twelve genotypes of mumps virus have been identified. The virus is considered to be serologically monotypic and immunity induced by one mumps virus strain should protect against infection against any other strain.

b. Disease. Mumps is characterized by fever, swelling, and tenderness of one or more salivary, parotid, and sometimes sublingual or submaxillary glands. Prodromal symptoms are nonspecific and include myalgia, anorexia, malaise, headaches, and low-grade fever. Parotitis (inflammation of the parotid gland) is the most common manifestation and occurs in 30-40% of cases. Complications include meningitis, inflammation of the testicles or ovaries, and deafness (usually permanent).

c. Epidemiology. Mumps occurs globally and is transmitted via respiratory droplets containing the virus from the saliva of an infected person. The number of reported mumps cases in the United States has decreased more than 99% since licensure of the mumps vaccine in 1967. Before vaccine availability, most reported cases occurred in children 5 to 9 years old. In a recent US mumps outbreak, which occurred in 2006, 45 states reported more than 6,000 mumps cases. The risk of being infected was highest among people aged 18--24 years. Preliminary data suggest being unvaccinated or only having received one lifetime dose of MMR was a risk factor in the outbreak.

d. Vaccine. The mumps vaccine currently licensed in the United States contains a live attenuated (weakened) mumps virus first licensed by the Food & Drug Administration (FDA) as a single vaccine in 1967. This mumps virus, of the Jeryl Lynn strain, is grown in chick-embryo-cell culture. At present, mumps vaccine is only distributed in the US in combination with both rubella and measles vaccines, in the trivalent form known as MMR (*M-M-R-II*, Merck) or as MMR in combination with varicella (chickenpox) vaccine (*ProQuad*, Merck). Both *M-M-R-II* and *ProQuad* contain small amounts of egg protein, neomycin and gelatin.

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."

f. Immunization. MMR is administered subcutaneously as a 0.5-mL dose. Children receive the first dose at 12 to 15 months of age and the second dose at 4 to 6 years of age. Children who have not received the second dose by the 11- to 12-year-old visit should receive a catch-up dose. *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. Evidence of immunity for healthcare workers include documented administration of two doses mumps vaccine, laboratory evidence of immunity / disease or born before 1957. 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.

g. Adverse Events. The most common adverse reaction after MMR vaccination is fever and rash, 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 MMR vaccination and is caused by the rubella vaccine component. Joint aches and inflammation are reported in up to 25% of rubella-susceptible post-pubertal women who receive MMR or other rubella-containing vaccine.

h. DoD Policy. MMR is administered to all basic trainees and other accessions, unless they have documented evidence of two prior vaccinations or positive serological testing in accordance with service specific serological testing standards

### 3. References.

a. Centers for Disease Control and Prevention. Vaccine Use and Strategies for Elimination of Measles, Rubella, and Congenital Rubella Syndrome and Control of Mumps. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1998;47(RR-8):1-57.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/00053391.htm>

b. Centers for Disease Control and Prevention. Use of Combination Measles, Mumps, Rubella and Varicella Vaccine. . Recommendations of the Advisory Committee on

Immunization Practices (ACIP). MMWR 2010;59 (RR-3): 1-12.  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5903a1.htm>

c. Multiple resources (e.g., package insert, Vaccine Information Statements) assembled by Military Vaccine Agency: <http://www.vaccines.mil/mumps>

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