INFORMATION PAPER

Military Vaccine Agency
1 March 2007

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. 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% of cases. Complications include meningitis, inflammation of the testicles or ovaries, inflammation of the pancreas, and deafness (usually permanent).

b. 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, from 152,209 cases in 1968 to 274 cases in 2001. Before vaccine availability, most reported cases occurred in children 5 to 9 years old. In a recent US mumps outbreak, which occurred between January 1and May 2, 2006, 11 states reported a total of 2,597 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.

c. Vaccine. The mumps vaccine currently licensed in the United States contains a live attenuated (weakened) mumps virus (*Mumpsvax, Merck*), 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). MMR was licensed by the FDA in 1971 with a formulation improvement 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."

f. Adverse Events. The most common adverse reactions after MMR vaccine are 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 most by 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 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 to optimize immunity to all three diseases. In persons whose records show receipt of an older bivalent measles-rubella vaccine, administration of MMR vaccine to achieve immunity against mumps is not a military requirement, but may be appropriate in some clinical circumstances.

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. ftp://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4708.pdf

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

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

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