

# Influenza Vaccine

## Information Paper

*A licensed vaccine developed by DoD and its partner*

UNITED STATES ARMY MEDICAL RESEARCH  
AND MATERIEL COMMAND



**Product name:** Influenza virus vaccine  
**Commercial name:** Influenza virus vaccine  
**Date of U.S. licensure:** November 1945.  
**Type of product:** Inactivated whole-virus vaccine,  
**Company of manufacture:** Parke, Davis and Company,  
Detroit, Michigan

**Target Microorganism/associated disease:** Influenza viruses are comprised of 7-8 single-stranded RNA gene segments. The segmented nature of the genome permits reassortment of RNA between influenza viruses during dual infection, thereby creating forms of influenza unrecognized by the human immune system. Susceptibility to infection generally depends on host immunity. The major reservoir for influenza A in nature is aquatic fowl, although swine are susceptible to infection with influenza viruses from both birds and humans and may serve as a "mixing vessel" resulting in novel, disease-causing strains. Influenza A and B viruses are the principal causes of the epidemic influenza, although other respiratory viruses (including adenoviruses) can cause similar disease. Generalized symptoms, including fever, chills, muscle aches and headaches generally precede sore throat, nasal symptoms, hoarseness and cough. Death (in one-tenth of 1% of cases in most years) is limited to very young and very old persons. In pandemic years, larger proportions of young adults have died following an abbreviated course of illness sometimes marked by cyanosis and bloody sputum.

**Reasons for development:** Approximately one out of every 67 soldiers died of influenza during the influenza pandemic of 1918-1919. Furthermore, the close quartering and transport of large numbers of military members across oceans may have contributed to rapid spread of influenza globally during 1918-1919. If it had not been for the influenza pandemic, World War I would have been the first war when more people died of battlefield injuries than disease (but the U.S. Army lost a greater proportion of men to death by disease in 1918 than in any year since 1867).

**Role of Department of Defense in product development:** Influenza vaccine was developed to protect service members and civilians from sickness and death due to influenza. During the First World War, U.S. Army Surgeon General Gorgas developed a series of Commissions to gather the best civilian and military input on ongoing and recurring infectious disease problems. In the spring of 1918, a Pneumonia Commission was formed to study the unusually high numbers of complicated pneumonias and pleurisy occurring in the European



*Seattle policemen wear masks to guard against the 1918 flu pandemic, which killed more Americans than did World War I. Photo from American Museum of Natural History website.*

Theatre. Several Commissions continued during the interwar years. The Army established the Board for the Investigation and Control of Influenza and other epidemic diseases in 1941, which later became the Army Epidemiology Board and eventually the Armed Forces Epidemiology Board (in 1949). Influenza vaccine viral strains used to make the Parke, Davis and Company influenza vaccine were obtained from Dr. Thomas Francis, Jr., Commission on Influenza, U.S. Army, School of Public Health, University of Michigan, Ann Arbor, Michigan. (Dr. Francis is accredited with first isolating influenza B.) This inactivated vaccine was studied in military recruits and college students. (The live-attenuated influenza vaccine licensed in 2003 also originated from this University of Michigan laboratory).

DoD has also funded studies investigating the transmission and prevention of influenza in military populations. In 1976, an outbreak of influenza on a military post caused by influenza similar to the causative agent of the 1918-1919 pandemic resulted in an effort to immunize the entire population of the United States. Because of reports of Guillain-Barre syndrome (GBS) in civilian (but not military) recipients of influenza vaccine, the immunization effort was terminated. Between 1961 and 1993, the AFEB made 53 separate recommendations regarding the composition of influenza vaccines. More recently, the Assistant Secretary of Defense (Health Affairs) has issued several policy statements per year guiding the DOD in influenza, management, and DOD representatives often participate in the FDA Advisory Committee that reviews influenza-related products.

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