A Need To Update and Revise the Pneumococcal Vaccine Recommendations for Adults

Our preoccupation with new microbial threats (severe acute respiratory syndrome, West Nile virus, and potential bioterrorism agents) has preempted attention from more familiar but still dangerous foes. Influenza and invasive pneumococcal disease, which together cause more than 30,000 deaths each year in the United States, remain the greatest public health challenge as measured by vaccine-preventable morbidity and mortality (1, 2).

Recommendations for the use of influenza and pneumococcal vaccines in adults are both age based (recognizing that disease incidence and mortality increase with age) and condition based (recognizing that certain underlying diseases or conditions increase the incidence or severity of influenza and invasive pneumococcal disease). There is a high degree of similarity in the list of high-risk conditions for which influenza vaccine is recommended and the list for which pneumococcal vaccine is recommended. As a result, recognition that an individual needs one vaccine should prompt consideration for the other vaccine to be given also.

In 2000, the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) recommended that universal immunization of adults with influenza vaccine be initiated at 50 years of age (previously, the age for universal immunization for both influenza and pneumococcal vaccines was 65 years) on the basis of cost–benefit studies showing decreased disease, absenteeism, medical costs, and antibiotic use among vaccine recipients 50 through 64 years of age (2). In this issue, Sisk and colleagues (3) provide strong impetus for also lowering the recommended age for universal immunization with pneumococcal vaccine to 50 years of age. First, using only the well-established vaccine benefit of protection against invasive pneumococcal disease (for example, bacteremia and meningitis) and conservative estimates of the duration of benefit (maximum, 6 years), Sisk and colleagues show that for the overall population age 50 through 64 years, the cost per added year of healthy life is well below that of well-established preventive measures, such as screening for colon cancer. Second, for individuals 50 through 64 years of age with high-risk conditions, pneumococcal vaccine actually saved medical costs and improved health. Third, cost–benefit analysis in both high- and low-risk groups showed greater benefit for African Americans. It has long been recognized that certain ethnic populations (for example, African Americans, Native Americans, and Alaska Natives) suffer rates of invasive pneumococcal disease 2 to 10 times greater than the general population and that the risk is manifest at an earlier age (1).

Lowering the age of universal immunization with pneumococcal vaccine to 50 years would yield the benefits of “harmonizing” the influenza and pneumococcal immunization efforts and expanding the preventive approach to invasive pneumococcal disease at a time when antibiotic-resistant strains of pneumococci have become common.

The pneumococcal vaccine recommendations need to be updated as new information on risk factors becomes available. Cigarette smoking has been identified as a strong risk factor for invasive pneumococcal disease even after multivariate adjustment for age; race; and recognized risk conditions, such as chronic cardiac disease, chronic pulmonary disease, and diabetes mellitus (4). Thus, it has earned (but not yet received) official designation as an indication for pneumococcal vaccination.

Adding up the evidence and accounting for overlap, one can conclude that approximately half of individuals 50 through 64 years of age should receive the pneumococcal vaccine. Among the approximately 42 million persons in the United States 50 through 64 years of age, 12 million (29%) have one or more high-risk medical conditions indicating a need for pneumococcal immunization (5). African Americans, Native Americans, and Alaska Natives (all groups at increased risk for invasive pneumococcal disease in the 50- through 64-year-old age group) constitute approximately 18% to 20% of the population. The prevalence of cigarette smoking (recently recognized as a leading risk factor for invasive pneumococcal disease) is approximately 17% to 20% among persons 50 through 64 years of age in the United States (6). Logistics and the simplicity of age-based recommendations favor implementing universal pneumococcal vaccine beginning at age 50 years.

What are the concerns and potential problems with such a change? There is an embarrassing paucity of data about the duration of protection after primary immunization and issues relating to reimmunization. Twenty years after licensure of the current 23-valent polysaccharide vaccine, no studies have examined vaccine efficacy or effectiveness after a second dose of vaccine and data on immunogenicity or reactogenicity are incomplete. There is almost no published information about three or more doses and, as a result, advisory boards are understandably reluctant to make reimmunization recommendations without fundamental data. However, many physicians have chosen to reimmunize patients at 5- to 10-year intervals, and the U.S. Preventive Services Task Force has recommended universal reimmunization at age 75 years (7).

Because the adult vaccine formulation elicits a T-cell–independent immune response, reimmunization does not induce an anamnestic response and the resultant antibody titers are similar to or lower than that achieved after primary immunization (8). This raises the question of
whether “premature” immunization at an earlier age might blunt the protection of future vaccination at an age when the risks for invasive pneumococcal disease are higher. Again, no data bear on this issue.

Hope for a new and more efficacious pneumococcal vaccine for adults has been spurred by the spectacular success of the 7-valent conjugate pneumococcal vaccine used in children. It has reduced not only serious pneumococcal infections in children but also the carriage or reservoir of vaccine type pneumococci in children, which seems to have had the secondary benefit of reducing the incidence of invasive pneumococcal disease in adults (9). Progress toward a conjugate vaccine suitable for the diverse pneumococcal serotypes that cause disease in adults has been slow, and current efforts are focused on protein antigens.

It appears that at least for the next decade, we will need to use our current, imperfect product in the most judicious way. My vote is to follow the data of Sisk and colleagues and the new information about special risks related to ethnicity and cigarette smoking, to establish age 50 years as the time to initiate universal immunization with pneumococcal vaccine, and thereby to reunite the pneumococcal and influenza vaccine programs. In addition, recognizing that the risks for invasive pneumococcal disease continue to increase with age and that the vaccine has an excellent safety profile, I would support those who favor reimmunizing individuals every 5 to 10 years while waiting for better data or better vaccines.

Pierce Gardner, MD
National Institutes of Health
Bethesda, MD 20892

Potential Financial Conflicts of Interest: Honoraria (Wyeth, Merck).

Requests for Single Reprints: Pierce Gardner, MD, Fogarty International Center, National Institutes of Health, Building 31, Room B2C02, Bethesda, MD 20892-2220.


References