

APPENDIX H  
*Standards*

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**Adult Immunization: Summary of the National Vaccine  
Advisory Committee Report, *JAMA* 1994;272:1133-7. . . . .** H-42

# **Standards for Child and Adolescent Immunization Practices**

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Atlanta, GA 30333-0418

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## Introduction

In 1992, the National Vaccine Advisory Committee (NVAC), in collaboration with the Ad Hoc Working Group for the Development of Standards for Pediatric Immunization Practices, a working group representing public and private agencies with input from state and local health departments, physician and nursing organizations, and public and private providers, developed a set of standards as to what constitutes the most essential and desirable immunization policies and practices. These standards were endorsed by a variety of medical and public health organizations and represented an important element in our national strategy to protect America's children against vaccine-preventable diseases.

Since that time, vaccine delivery in the US has changed in several important ways. First, vaccination coverage rates among preschool children have increased substantially and are now monitored by the National Immunization Survey.<sup>1,2</sup> Second, vaccination of children has shifted markedly from the public to the private sector,<sup>3,4,5</sup> with an emphasis on vaccination in the context of primary care and the Medical Home.<sup>6</sup>

The Vaccines for Children Program has provided critical support to this shift by covering the cost of vaccinations for the most economically disadvantaged children and adolescents. Third, the development and introduction of performance measures, such as the National Committee for Quality Assurance's HEDIS (Health Plan Employer Data and Information Set),<sup>7</sup> have focused national attention upon the quality of preventive care, including vaccination. Finally, high quality research in health services has helped to refine strategies for raising and sustaining vaccination coverage levels among children, adolescents, and adults.<sup>8</sup>

Health care professionals who vaccinate children and adolescents continue to face important challenges. These challenges include a diminishing level of experience-among patients, parents and physicians-with the diseases that vaccines prevent, the ready availability of vaccine-related information that may be inaccurate or misleading, the increasing complexity of the vaccination schedule, and the failure of many health plans to pay for the costs associated with vaccination. In addition, recommendations from the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP) and the American Medical Association (AMA) in 1996 underscore the need to focus on adolescent vaccination.<sup>9</sup>

In this context, NVAC, along with partners representing federal agencies, state and local health departments, and professional organizations, revised and updated the Standards during 2001-02 to reflect these changes and challenges in vaccine delivery. The revision was approved by NVAC on February 8, 2002 and distributed widely among a variety of medical and public health organizations for review and endorsement. More than 40 organizations have formally endorsed the Standards for Child and Adolescent Immunization Practices.

The Standards are directed toward "health care professionals," an inclusive term for the many persons in clinical settings who share in the responsibility for vaccination of children and adolescents: physicians, nurses, mid-level practitioners (e.g., nurse practitioners, physician assistants), medical assistants, and clerical staff. In addition to this primary audience, the Standards are intended to be useful to public health professionals, policy makers, health plan administrators, employers who purchase health care coverage, and others whose efforts shape and support the delivery of vaccination services.

Of note, the use of the term "standards" should not be confused with a minimum standard of care. Rather, these Standards represent the most desirable immunization practices, which health care professionals should strive to achieve. Given current resource limitations, some health care professionals may find it difficult to implement all of the Standards, because of circumstances over which they have little control. The expectation is that, by summarizing best immunization practices in a clear and concise format, the Standards will assist these providers in securing the resources necessary to implement this set of recommendations.

By adopting these Standards, health care professionals can enhance their own policies and practices, making achievement of vaccination objectives for children and adolescents as outlined in Healthy People 2010, a nationwide health promotion and disease prevention agenda from the U.S. Department of Health and Human Services,<sup>10</sup> both feasible and likely. Achieving these objectives will improve the health and welfare of all children and adolescents as well as the communities in which they live.

## Standards for Child and Adolescent Immunization Practices

### *Availability of vaccines*

1. Vaccination services are readily available.
2. Vaccinations are coordinated with other health care services and provided in a Medical Home<sup>6</sup> when possible.
3. Barriers to vaccination are identified and minimized.
4. Patient costs are minimized.

### *Assessment of vaccination status*

5. Health care professionals review the vaccination and health status of patients at every encounter to determine which vaccines are indicated.
6. Health care professionals assess for and follow only medically accepted contraindications.

### *Effective communication about vaccine benefits and risks*

7. Parents/guardians and patients are educated about the benefits and risks of vaccination in a culturally appropriate manner and in easy-to-understand language.

### *Proper storage and administration of vaccines and documentation of vaccinations*

8. Health care professionals follow appropriate procedures for vaccine storage and handling.
9. Up-to-date, written vaccination protocols are accessible at all locations where vaccines are administered.
10. Persons who administer vaccines and staff who manage or support vaccine administration are knowledgeable and receive on-going education.
11. Health care professionals simultaneously administer as many indicated vaccine doses as possible.
12. Vaccination records for patients are accurate, complete, and easily accessible.
13. Health care professionals report adverse events following vaccination promptly and accurately to the Vaccine Adverse Event Reporting System (VAERS) and are aware of a separate program, the National Vaccine Injury Compensation Program (VICP).
14. All personnel who have contact with patients are appropriately vaccinated.

### *Implementation of strategies to improve vaccination coverage*

15. Systems are used to remind parents/guardians, patients, and health care professionals when vaccinations are due and to recall those who are overdue.
16. Office- or clinic-based patient record reviews and vaccination coverage assessments are performed annually.
17. Health care professionals practice community-based approaches.

## The Standards

### Availability of vaccines

#### 1. Vaccination services are readily available.

All health care professionals who provide primary care to children and adolescents should always include routinely recommended vaccines as a part of the care they deliver in the Medical Home.<sup>6</sup>

For some children and adolescents, the main contact with the health care system is not in a primary care provider's office, and therefore, opportunities for vaccination may be missed. Thus, specialists and health care professionals in settings such as schools and school health clinics, sports physical clinics, family planning clinics, sexually transmitted disease (STD) clinics, and substance abuse treatment centers, should assess each patient's vaccination status and either offer indicated vaccines or refer for vaccination if necessary.

Information on vaccines administered outside the primary care setting should be communicated to the primary care provider.

#### 2. Vaccinations are coordinated with other health care services and provided in a Medical Home<sup>6</sup> when possible.

Ideally, vaccines should be given as part of comprehensive health care. In primary care settings, vaccination services should be coordinated with routine well-care visits and other visits. Patients vaccinated in other settings should be encouraged to receive subsequent vaccines in their primary care setting. Patients without a primary care provider should be assisted with identifying one.

#### 3. Barriers to vaccination are identified and minimized.

Barriers to receiving vaccines include delays in scheduling appointments, requiring a well-care visit, long waiting periods in the office, and lack of culturally and age-appropriate educational materials. A physical exam, while an important part of well care, should not be required before administering vaccines: simply observing the patient and questioning about the patient's health status, immunization history, and vaccine contraindications are sufficient. In addition, vaccination-only visits should be available.

Health care professionals should seek advice from parents/guardians and patients to identify ways to make vaccination services easier to use.

#### **4. Patient costs are minimized.**

Out-of-pocket costs-including vaccine, administration, and office visit fees-should be as low as possible for all patients, and no child or adolescent should be denied vaccination because of inability to pay.

Resources should be identified to keep patient vaccination costs as low as possible. Free vaccine is available through some public programs, although health care professionals offering these vaccines may charge a reasonable administration fee. Sources of publicly funded vaccines include the Vaccines for Children (VFC) Program, Public Health Service Section 317 grants to States, and state or local programs. Children and adolescents should be screened for their eligibility to receive vaccines through these programs. Vaccinations provided through VFC or Section 317 grants may not be denied because of an inability to pay the administration fee, and health care professionals should assure that parents/guardians and patients are aware of this requirement (applies to all vaccines purchased using Centers for Disease Control and Prevention contracts, regardless of the setting-private or public-in which the vaccines are administered).

To minimize costs for patients, health plans and insurance plans should include the provision and administration of all routinely recommended vaccines as a covered benefit for all children and adolescents. Furthermore, to minimize costs for health care professionals, purchasers and health plans should reimburse health care professionals adequately for delivering vaccines, including the time required for vaccine administration and for communication about vaccine benefits and risks.

*\* Further information*

*CDC maintains a web page about VFC on the Internet at: [www.cdc.gov/nip/vfc](http://www.cdc.gov/nip/vfc)*

#### **Assessment of vaccination status**

#### **5. Health care professionals review the vaccination and health status of patients at every encounter to determine which vaccines are indicated.**

Health care professionals should review the vaccination status of all patients at all health care visits to minimize the number of missed opportunities to vaccinate. This review should determine if the patient has received any vaccinations elsewhere or is at high risk for disease or undervaccination. This information should be documented in the patient's chart and preventive health summary. Health care professionals who do not offer vaccinations should refer patients to a primary care provider for needed vaccinations.



### **6. Health care professionals assess for and follow only medically accepted contraindications.**

Withholding vaccinations due to medical concerns that are not contraindications results in missed opportunities for prevention. Health care professionals should ask about any condition or circumstance that might indicate a vaccination should be withheld or delayed and about prior adverse events temporally associated with any vaccination.

Health care professionals should support their decisions about what constitutes a contraindication or deferral for each vaccine by consulting the Guide to Contraindications to Vaccinations published by CDC (available on the Internet at: [www.cdc.gov/nip/recs/contraindications.pdf](http://www.cdc.gov/nip/recs/contraindications.pdf)), the harmonized recommendations of the ACIP, AAP, and AAFP (available on the Internet at: [www.cdc.gov/nip/recs/child-schedule.htm#Printable](http://www.cdc.gov/nip/recs/child-schedule.htm#Printable)), the AAP's Red Book, and other relevant recommendations, Vaccine Information Statements, and manufacturers' package inserts. Contraindications and deferrals should be documented in the medical record.

### **Effective communication about vaccine benefits and risks**

### **7. Parents/guardians and patients are educated about the benefits and risks of vaccination in a culturally appropriate manner and in easy-to-understand language.**

Health care professionals should allow sufficient time with parents/guardians and adolescent patients to discuss the benefits of vaccines, the diseases they prevent, any known risks from vaccines, the immunization schedule and the need to receive vaccines at the recommended ages, and the importance of bringing the patient's hand-held vaccination record to each health care visit. Health care professionals should encourage parents/guardians and adolescent patients to take responsibility for ensuring that the patient is fully vaccinated.

For all commonly used childhood vaccines, all health care professionals are required by federal law to give Vaccine Information Statements (VIS) to vaccine recipients or their parents/guardians at each visit. A VIS is a vaccine-specific, two-page information sheet, produced by CDC, which describes the benefits and risks of a vaccine. If necessary, health care professionals should supplement the VIS with oral explanations or other written materials that are culturally and linguistically appropriate. Health care professionals should review written materials with patients and their parents/guardians and address questions and concerns.

Health care professionals should encourage parents/guardians and adolescent patients to inform the health care professional of adverse events following the vaccine to be administered and explain how to obtain medical care, if necessary.

See Standard 13 for a description of the Vaccine Adverse Events Reporting System (VAERS).

*\* Further information*

*General vaccination information for health care professionals, parents, and members of the public may*

be obtained by calling the CDC National Immunization Information Hotline at 1-800-232-2522 (English) or 1-800-232-0233 (Spanish). Information about vaccine risk communication for health care professionals can be found on the Internet at: [www.cdc.gov/nip/vacsafe/research/peds.htm](http://www.cdc.gov/nip/vacsafe/research/peds.htm) and in the latest edition of the Red Book. Vaccine Information Statements are available in English and numerous other languages from State health departments and on the Internet at: [www.cdc.gov/nip/publications/VIS/default.htm](http://www.cdc.gov/nip/publications/VIS/default.htm) and [www.immunize.org](http://www.immunize.org). Recommendations for national standards for culturally and linguistically appropriate services (CLAS) in health care may be found on the Internet at: [www.omhrc.gov/omh/programs/2pgprograms/finalreport.pdf](http://www.omhrc.gov/omh/programs/2pgprograms/finalreport.pdf)

## **Proper storage and administration of vaccines and documentation of vaccinations**

### **8. Health care professionals follow appropriate procedures for vaccine storage and handling.**

Vaccines should be handled and stored as recommended in the manufacturers' package inserts; the expiration date for each vaccine should be noted. Temperatures at which vaccines are stored and transported should be monitored and recorded twice daily. Summary information about vaccine storage and handling procedures are also available from state and local health departments and CDC.

Health care professionals should monitor vaccine inventory and undertake efforts to reduce wastage and loss.

#### *\* Further information*

CDC-recommended storage and handling procedures are available from CDC by calling 404-639-8222.

### **9. Up-to-date, written vaccination protocols are accessible at all locations where vaccines are administered.**

To promote the safe and effective use of vaccines, health care professionals should maintain written protocols that detail the following: vaccine storage and handling; the recommended vaccination schedule, vaccine contraindications, and administration techniques; treatment and reporting of adverse events; vaccine benefit and risk communication; and vaccination record maintenance and accessibility.

These protocols should be consistent with established guidelines, reviewed frequently, and revised as needed to assure that they remain up-to-date.

### **10. Persons who administer vaccines and staff who manage or support vaccine administration are knowledgeable and receive on-going education.**

Health care professionals or others who administer vaccinations should be knowledgeable and receive continuing education in vaccine storage and handling; the recommended vaccine schedule, contraindications, and administration techniques; treatment and reporting of adverse events; vaccine benefit and risk communication; and vaccination record maintenance and accessibility. With appropriate training, and in accordance with state law/regulation/policy, persons other than physicians and nurses may administer vaccines. In addition, other staff should receive training and continuing education related to their specific roles and responsibilities that affect vaccination services.

*\* Further information CDC sponsors distance-based training opportunities (e.g., satellite broadcasts, web-based training, videotapes, self-administered print materials) for health care professionals. Information about training is available on the Internet at: [www.cdc.gov/nip/ed](http://www.cdc.gov/nip/ed)*

### **11. Health care professionals simultaneously administer as many indicated vaccine doses as possible.**

Administering vaccines simultaneously (at the same visit), in accordance with recommendations from the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians, is safe, effective, and indicated. Although the immunization schedule provides age flexibility for administering certain vaccine doses, simultaneous administration decreases the number of visits needed and the potential for missed doses, and enables earlier protection. When indicated vaccines are not simultaneously administered, arrangements should be made for the patient's earliest return to receive the needed vaccination(s).

*\* Further information*

*Additional information on the safety of simultaneous vaccination may be found on the Internet at: [www.cdc.gov/nip/vacsafe/research/simultaneous.htm](http://www.cdc.gov/nip/vacsafe/research/simultaneous.htm)*

### **12. Vaccination records for patients are accurate, complete, and easily accessible.**

Vaccination records for patients should be recorded on a standard form in an easily accessible location in the medical record to facilitate rapid review of vaccination status. Accurate record keeping helps to ensure that only needed vaccinations are given. As required by federal law (42 US Code 300aa-25), health care professionals should assure that records contain the following information for each vaccination: the date of administration, the vaccine manufacturer and lot number, the signature and title of the person administering the vaccine, and the address where the vaccine was given. Vaccine refusal should also be documented.

The medical record maintained by the primary care provider should document all vaccines received, including those received at a specialist's office or in another health care setting. When a health care professional who does not routinely care for a patient vaccinates that patient, the patient's primary care provider should be informed.

All vaccinations administered should be reported to state or local immunization registries, where available, to ensure that each patient's vaccination history remains accurate and complete. Registries also may be useful for verifying the vaccination status of new patients, determining which vaccines are needed at a visit, printing official records, and providing reminders and recalls to parents.

Health care professionals should assure that each patient has a hand-held vaccination record that documents each vaccine received, including the date and the name of the health care professional who administered the vaccine. Health care professionals should encourage parents/guardians and adolescent patients to bring the patient's hand-held record to each health care visit so it can be updated.

*\* Further information*

*The CDC maintains an Immunization Registry Clearinghouse. Information about this clearinghouse is available on the Internet at: [www.cdc.gov/nip/registry/](http://www.cdc.gov/nip/registry/)*

**13. Health care professionals report adverse events following vaccination promptly and accurately to the Vaccine Adverse Event Reporting System (VAERS) and are aware of a separate program, the National Vaccine Injury Compensation Program (VICP).**

Health care professionals should promptly report all clinically significant adverse events following vaccination to the Vaccine Adverse Event Reporting System (VAERS) even if the health care professional is not certain that the vaccine caused the event. Health care professionals should document in detail the adverse event in the patient's medical record as soon as possible. Providers should be aware that parents/guardians and patients may report to VAERS, and that if they choose to do so, they are encouraged to seek the help of their health care provider.

The National Vaccine Injury Compensation Program (VICP) is a no-fault system that compensates persons of any age for injuries or conditions that may have been caused

by a vaccine recommended by CDC for routine use in children. Health care professionals should be aware of the VICP in order to address questions raised by parents/guardians and patients.

Since VAERS and VICP are separate programs, a report of an event to VAERS does not result in the submission of a compensation claim to VICP. A brief description and contact information for both programs is provided on each Vaccine Information Statement for those vaccines covered by the National Childhood Vaccine Injury Act.

*\* Further information*

Information about VAERS, as well as guidance about how to obtain and complete a VAERS form can be found on the Internet: [www.vaers.org](http://www.vaers.org) or by calling 1-800-822-7967. Information about the VICP is available on the Internet at: [www.hrsa.gov/osp/vicp](http://www.hrsa.gov/osp/vicp) or by calling 1-800-338-2382.

**14. All personnel who have contact with patients are appropriately vaccinated.**

Health care professionals and other personnel who have contact with patients should be appropriately vaccinated. Offices and clinics should have policies to review and maintain the vaccination status of staff and trainees.

*\* Further information*

ACIP recommendations for vaccinating health care workers are available on the Internet at: [ftp://ftp.cdc.gov/pub/publications/mmwr/rr/rr4618.pdf](http://ftp.cdc.gov/pub/publications/mmwr/rr/rr4618.pdf)

### **Implementation of strategies to improve vaccination coverage**

**15. Systems are used to remind parents/guardians, patients, and health care professionals when vaccinations are due and to recall those who are overdue.**

Evidence demonstrates that reminder/recall systems improve vaccination coverage.<sup>11</sup>

Patient reminder/recall interventions inform individuals that they are due (reminder) or overdue (recall) for specific vaccinations. Patient reminders/recalls can be mailed or communicated by telephone; an autodialer system can be used to expedite telephone reminders. Patients who might be at high risk for not complying with medical recommendations, for example those who have missed previous appointments, should receive more intensive follow-up.

Similarly, provider reminder/recall systems alert health care professionals when vaccines are due or overdue. Notices should be placed in patient charts or communicated to health care professionals by computer or other means. Immunization registries can facilitate automatic generation of reminder/recall notices.

**16. Office- or clinic-based patient record reviews and vaccination coverage assessments are performed annually.**

Evidence shows that assessments are most effective in improving vaccination coverage in a practice when they combine chart reviews to determine coverage with the provision of results to health care professionals and staff.<sup>11</sup>

Effective interventions also may incorporate incentives or compare performance to a goal or standard. Coverage should be assessed regularly so that reasons for low coverage in the practice, or in a sub-group of patients, are identified and addressed. For assistance in conducting vaccination coverage assessments, health care professionals should contact their state or local immunization program.

**17. Health care professionals practice community-based approaches.**

All health care professionals share in the responsibility to achieve the highest possible degree of community protection against vaccine-preventable diseases.

Immunization protects the entire community as well as the individual. No community is optimally protected against vaccine-preventable diseases without high vaccination coverage. Therefore, health care professionals should consider the needs of the community (especially underserved populations) as well as those of their patients. Community-based approaches may involve working with partners in the community, including public health departments, managed care organizations, other service providers such as the US Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), advocacy groups, schools, and service organizations to determine community needs and develop vaccination services that address these needs.

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- 11 Task Force on Community Preventive Services. Recommendations regarding interventions to improve vaccination coverage in children, adolescents, and adults. *Am J Prev Med.* 2000; 18 (1S): 92-96.



## **Organizations providing endorsement for the revised Standards for Child and Adolescent Immunization Practices**

Advisory Committee on Immunization Practices

Albert B. Sabin Vaccine Institute

Ambulatory Pediatric Association

American Academy of Family Physicians

American Academy of Pediatrics

American Academy of Physician Assistants

American College of Emergency Physicians

American College of Osteopathic Pediatricians

American College of Preventive Medicine

American Medical Association

American Nurses Association

American Osteopathic Association

American Public Health Association

Association of Immunization Program Managers

Association of Maternal and Child Health Programs

Association of State and Territorial Health Officials

Center for Pediatric Research

Centers for Medicare and Medicaid Services Council of State and Territorial Epidemiologists

Every Child by Two

Health Resources and Services Administration



Immunization Action Coalition

Infectious Diseases Society of America

National Alliance for Hispanic Health

National Asian Women's Health Organization

National Assembly on School-Based Health Care

National Association for City and County Health Officials

National Association for Pediatric Nurse Practitioners

National Association of School Nurses

National Coalition for Adult Immunization

National Foundation for Infectious Diseases

National Institute of Allergy and Infectious Diseases

National Medical Association

National Network of Immunization Nurses and Associates

National Partnership for Immunization

National Perinatal Association Partnership for Prevention

Pediatric Infectious Disease Society

Project Immunize Virginia

Society for Adolescent Medicine

Society for Teachers of Family Medicine

Vaccine Education Center at the Children's Hospital of Philadelphia

## The National Vaccine Advisory Committee (NVAC)

### Committee History

The National Vaccine Advisory Committee (NVAC) was chartered in 1988 to advise and make recommendations to the director of the National Vaccine Program and the assistant secretary for health, Department of Health and Human Services, on matters related to the prevention of infectious diseases through immunization and the prevention of adverse reactions to vaccines.

The NVAC is composed of 15 members from public and private organizations representing vaccine manufacturers, physicians, parents, and state and local health agencies. In addition, representatives from governmental agencies involved in health care or allied services serve as ex-officio members of the NVAC.

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# Standards for Adult Immunization Practices

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## Introduction

As a result of successful immunization practices geared toward infants and children in the United States, the incidence of childhood vaccine-preventable diseases has declined dramatically. However, similar success among adults has not been achieved.

All adults should be immune to measles, mumps, rubella, tetanus, diphtheria, and varicella. All those aged 50 or older, and younger persons at high risk should receive influenza vaccine annually; all those aged 65 or older, and younger persons at high risk, should receive pneumococcal vaccine. Adults susceptible to hepatitis A, hepatitis B, and polio should be vaccinated if they are at risk for exposure to an infection. Ideally, recommended vaccines should be given to all adults as a routine part of health care.

Adults suffer the vast majority of vaccine-preventable disease in the U.S. During average influenza seasons, up to 40 million Americans may suffer from influenza infection, approximately 100,000 are hospitalized, and approximately 40,000 die of influenza and its complications.<sup>1,2</sup> Pneumococcal infections account for 100,000 to 135,000 hospitalizations for pneumonia, more than 60,000 cases of bacteremia and other forms of invasive disease, and about 7,000 death from invasive pneumococcal disease each year.<sup>3,4,5</sup> More than 75,000 persons, mostly adolescents and adults, contract hepatitis B each year.<sup>6,7</sup> There are approximately 4,000 to 5,000 deaths due to hepatitis B each year, mainly among adults.<sup>8</sup> Approximately 8 million young women are unprotected against rubella, putting their infants at risk for congenital rubella syndrome if these women should become pregnant.<sup>9</sup> Up to half of all Americans age 50 and older have not received all of their recommended immunizations against tetanus and diphtheria.<sup>10</sup>

Today, vaccines are safe, effective, and readily available. Benefits of vaccination include reduced disease incidence, morbidity and mortality, and reduced health care costs. However, vaccines remain underutilized among adults, especially among persons at high risk for infection and complications of disease, and among certain racial/ethnic populations. For instance, the rates of influenza and pneumococcal vaccination in African American and Hispanic populations are significantly lower than those among whites.<sup>11</sup>

The U.S. Department of Health and Human Services' Healthy People 2010 outlines a comprehensive, nationwide health promotion and disease prevention agenda.<sup>12</sup> There are 8 objectives that relate to adult immunizations or vaccine-preventable diseases. Achieving these objectives will require a dramatic increase from current coverage levels.

For example, for influenza and pneumococcal vaccination of adults age 65 and older, the target coverage is 90% for annual influenza immunization and 90% for one dose of pneumococcal vaccine. In 2002, national statistics demonstrated rates of only 66% and 56%, respectively.<sup>13</sup> Among adults aged 65 years or less at high risk due to medical, behavioral, or environmental risk factors, even greater increases will be required to reach the 2010 targets.



In 1990, the National Coalition for Adults Immunization (NCAI) developed the first Standards for Adult Immunization Practices, which were endorsed by more than 60 professional organizations from the public and private sectors.<sup>14</sup> In January 1994, the National Vaccine Advisory Committee (NVAC) reviewed the status of adult immunization in the United States and presented specific goals and recommendations for improvement.<sup>15</sup> In 2000, NVAC issued a report on adult immunization programs in nontraditional settings. This report included quality standards for these programs as well as guidance for program evaluation.<sup>16</sup>

To reflect the recommendations and standards in these recent reports and the Healthy People 2010 coverage goals, the NVAC and NCAI have revised the 1990 Standards. The revised Standards are more comprehensive than the previous version and evidence-based medicine has been used to support these Standards wherever possible.<sup>17</sup> The Standards supplement research with expert consensus in areas where research does not offer guidance but experience does.

Today, more tools are available to support immunization providers. The revised Standards include links to web sites that contain information on model standing order policies, instructions for setting up reminder/recall systems, and templates for personal vaccination records.

The revised Standards for Adult Immunization Practices provide a concise, convenient summary of the most desirable immunization practices. The Standards have been widely endorsed by major professional organizations. This revised version of the Standards for Adult Immunization Practices is recommended for use by all health care professionals and payers in the public and private sectors who provide immunizations for adults. Everyone involved in adult immunization should strive to follow these Standards. Not all practices and programs have the resources necessary to fully implement the Standards, nevertheless, those lacking the resources should find the Standards useful to guide current practice and to guide the process of defining immunization needs and obtaining additional resources in the future.

## Standards for Adult Immunization Practices

### *Make vaccinations available*

1. Adult vaccination services are readily available.
2. Barriers to receiving vaccines are identified and minimized.
3. Patient "out of pocket" vaccination costs are minimized.

### *Assess patients' vaccination status*

4. Health care professionals routinely review the vaccination status of patients.
5. Health care professionals assess for valid contraindications.

### *Communicate effectively with patients*

6. Patients are educated about risks and benefits of vaccination in easy-to-understand language.

### *Administer and document vaccinations properly*

7. Written vaccination protocols are available at all locations where vaccines are administered.
8. Persons who administer vaccines are properly trained.
9. Health care professionals recommend simultaneous administration of all indicated vaccine doses.
10. Vaccination records for patients are accurate and easily accessible.
11. All personnel who have contact with patients are appropriately vaccinated.

### *Implement strategies to improve vaccination rates*

12. Systems are developed and used to remind patients and health care professionals when vaccinations are due and to recall patients who are overdue.
13. Standing orders for vaccinations are employed.
14. Regular assessments of vaccination coverage levels are conducted in a provider's practice.

### *Partner with the community*

15. Patient-oriented and community-based approaches are used to reach target populations.

## The Standards

### Make Vaccinations Available

**Standard 1:** *Adult vaccination services are readily available*

Primary care health care professionals who serve adults should always include routinely recommended vaccinations as part of their care. Specialists, whose patients may be at increased risk of vaccine-preventable diseases, also should include routinely recommended vaccinations as part of their care. For selected vaccines (e.g., meningococcal vaccine for college entrants, vaccines for international travelers) patients may be referred to another provider.

**Standard 2:** *Barriers to receiving vaccines are identified and minimized*

Barriers to receiving vaccines may include requiring a physical examination before vaccination, requiring an additional visit for vaccination, long waiting periods, and lack of educational materials that are culturally appropriate. Prior to vaccine administration, simply observing the patient, asking if the patient is well and questioning the patient/guardian about vaccine contraindications is sufficient.

**Standard 3:** *Patient "out of pocket" vaccination costs are minimized*

Resources should be identified to keep patient vaccination costs as low as possible, specifically for those patients aged 65 years or older and for vaccines not covered by Medicare Part B.

In the public sector, patient fees should include only the cost of vaccine and administration that cannot be funded through another source. In the private sector, routinely recommended vaccination services should be included in basic benefits packages. System and policy changes should be addressed to provide adequate reimbursement to providers for delivering vaccinations to their adult population.

### Assess Patients' Vaccination Status

**Standard 4:** *Health care professionals routinely review the vaccination status of patients*

Health care professionals should review and document the vaccination status of all new patients during initial office visits and also review vaccination status on an annual basis thereafter.

Health care professionals should ascertain if the patient has medical risk factors, lifestyle risk factors, or an occupation for which certain vaccines may be indicated. Health care professionals should record this information in the patient's chart and preventive health summary. Health care professionals should routinely review pneumococcal vaccination status at the time of influenza vaccination.

**Standard 5:** *Health care professionals assess for valid contraindications*

Failure to differentiate between valid and invalid contraindications often results in the needless deferral of indicated vaccinations. Health care professionals should ask about prior adverse

events in connection with a vaccination and about any conditions or circumstances that might indicate vaccination should be withheld or delayed. Health care professionals should refer to current Advisory Committee on Immunization Practices (ACIP) recommendations on valid and invalid contraindications as well as on valid indications for vaccine use ([www.cdc.gov/nip](http://www.cdc.gov/nip)).

## **Communicate Effectively with Patients**

**Standard 6:** *Patients are educated about risks and benefits of vaccination in easy-to-understand language*

Health care professionals should discuss with the patient the benefits of vaccines, the diseases that they prevent, and any known risks from vaccines. These issues should be discussed in the patient's native language, whenever possible. Printed materials, accurately translated into the patient's language should be provided. For most commonly used vaccines, the U.S. Federal Government has developed Vaccine Information Statements for use by both public and private health care professionals to give to potential vaccine recipients. For vaccines covered by the National Childhood Vaccine Injury Act, including those vaccines used in children, these forms are required. These statements are available in English and other languages. Health care professionals should allot ample time with patients to review written materials and address questions and concerns. Information and assistance can be obtained by calling the Immunization Hotline (1-800-232-2522) or accessing the website ([www.cdc.gov/nip](http://www.cdc.gov/nip)).

Health care professionals should respect each patient's right to make an informed decision to accept or reject a vaccine or defer vaccination until more information is collected.

## **Administer and Document Vaccinations Properly**

**Standard 7:** *Written vaccination protocols are available at all locations where vaccines are administered*  
The medical protocol should detail procedures for vaccine storage and handling, vaccine schedules, contraindications, administration techniques, management and reporting of adverse events, and record maintenance and accessibility. These protocols should be consistent with established guidelines. CDC-recommended storage and handling procedures are available on the Internet at: [www.gravity.lmi.org/lmi\\_cdc/geninfo.htm](http://www.gravity.lmi.org/lmi_cdc/geninfo.htm).

Health care professionals should promptly report all clinically significant adverse events following vaccination to the Vaccine Adverse Event Reporting System (VAERS), even if the health care professional does not believe that the vaccine caused the event.

Reporting is required for those vaccines given to adults and medical conditions covered by the National Childhood Vaccine Injury Act of 1986, as amended. Health care professionals should be aware that patients may report to VAERS, and that if they choose to do so, they are encouraged to seek the help of their health care professional. Report forms and assistance are available by calling 1-800-822-7967 or on the Internet at [www.fda.gov/cber/vaers/vaers.htm](http://www.fda.gov/cber/vaers/vaers.htm).

The National Vaccine Injury compensation Program (VICP) is a no-fault system that compensates persons of any age for injuries or conditions that may have been caused by a vaccine recommended by CDC for routine administration to children. Health care professionals should be aware of the VICP in order to address questions raised by patients. Information about the VICP is available on the internet at [www.hrsa.gov/osp/vicp.htm](http://www.hrsa.gov/osp/vicp.htm) or by calling 1-800-338-2382.

Since VAERS and VICP are separate programs, a report of an event to VAERS does not result in the submission of a compensation claim to VICP. Such a claim must be filed independently in the U.S. Court of Federal Claims. A brief description and contact information for both programs is provided on each Vaccine Information Statement for vaccines covered by the VICP.

**Standard 8:** *Persons who administer vaccines are properly trained*

All persons who administer vaccinations should be fully trained in vaccine storage and handling, vaccine schedules, contraindications, administration techniques, management and reporting of adverse events, and record maintenance and accessibility. Office staff should receive continuing education on these issues annually. With appropriate training, persons other than physicians and nurses can administer vaccines. Health care professionals should contact public health authorities or other medical authorities in their state for more information concerning which individuals are permitted to administer vaccines.

**Standard 9:** *Health care professionals recommend simultaneous administration of all indicated vaccine doses*

Administering indicated vaccines simultaneously is safe and effective. Simultaneous administration decreases the number of required visits and the potential for missed doses. Measles, mumps, and rubella (MMR) vaccine and tetanus and diphtheria (Td) toxoids should always be administered in their combined product. Giving influenza and pneumococcal vaccine at the same time (but in separate arms) is also safe and effective. Health care professionals should respect the choices of patients and their caregivers.

**Standard 10:** *Vaccination records for patients are accurate and easily accessible*

Patient vaccination histories should be recorded on a standard form in an easily accessible location in the medical record to facilitate rapid review of vaccination status. Accurate record keeping helps ensure that needed vaccinations are administered and unnecessary vaccinations are not administered. Records should indicate the vaccine, the date of administration, the vaccine manufacturer and lot number, the signature and title of the person administering the vaccine, and the address where the vaccine was administered. The medical record at the primary care provider's office, clinic or worksite should include all vaccinations received (such as those received at a specialist's office, influenza vaccination clinic, or pharmacy).

Record keeping may be paper-based or computerized. Computer systems make record maintenance, retrieval, and review easier.

Health care professionals should give patients a personal record of vaccinations they have received, including the dates and places of administration. Patients should be encouraged to bring their vaccination records to all medical visits.

Information and a modifiable template of these forms and records are available at [www.ahcpr.gov/ppip/adultflow.pdf](http://www.ahcpr.gov/ppip/adultflow.pdf) and are also available on CD-ROM and can be ordered on the internet: [www.atpm.org/Immunization/whatworks.html](http://www.atpm.org/Immunization/whatworks.html)

**Standard 11:** *All personnel who have contact with patients are appropriately immunized*

Health care professionals and other personnel (including first responders) who have contact with patients should be appropriately immunized (e.g., annual influenza vaccination, hepatitis B vaccination). Institutions should have policies to review and maintain the appropriate vaccination of staff and trainees.

ACIP recommendations for vaccinating health care workers are available on the Internet: [www.cdc.gov/nip/publications/ACIP-list.htm](http://www.cdc.gov/nip/publications/ACIP-list.htm)

## Implement Strategies to Improve Vaccination Rates

**Standard 12:** *Systems are developed and used to remind patients and health care professionals when vaccinations are due and to recall patients who are overdue*

Evidence shows that reminder/recall systems improve adult vaccination rates. Systems may be designed to alert patients who are due (reminder) or overdue (recall) for specific vaccine doses or they may alert patients to contact their provider to determine if vaccinations are needed. Reminders or recalls can be mailed or communicated by telephone; an autodialer can be used to expedite telephone reminders. Patients who might be at high risk for not complying with medical recommendations may require more intensive follow-up.

Provider reminder/recall interventions inform those who administer vaccinations that individual patients are due or overdue for specific vaccinations. Reminders can be delivered in patient charts, by computer, and/or by mail or other means, and content of the reminders can be specific or general.

Information about these strategies and resources to assist in their implementation are available on CD-ROM and can be ordered on the internet: [www.atpm.org/Immunization/whatworks.html](http://www.atpm.org/Immunization/whatworks.html). Model reminder recall templates are also available at [www.ahcpr.gov/ppip/postcard.pdf](http://www.ahcpr.gov/ppip/postcard.pdf)

**Standard 13:** *Standing orders for vaccinations are employed*

Evidence shows that standing orders improve vaccination coverage among adults in a variety of health care settings, including nursing homes, hospitals, clinics, doctor's offices, and other institutional settings. Standing orders enable non-physician personnel such as nurses and pharmacists to prescribe or deliver vaccinations by approved protocol without direct physician involvement at the time of the interaction. Standing orders overcome administrative barriers such as lack of physician personnel to order vaccines. Further, the Centers for Medicare and Medicaid allow standing order exemption from medicare rules [www.cms.hhs.gov/medicaid/ltrscsp/sc0302.pdf](http://www.cms.hhs.gov/medicaid/ltrscsp/sc0302.pdf)

Information about this strategy and its implementation is available on CD-ROM and can be ordered on the internet: [www.atpm.org/Immunization/whatworks.html](http://www.atpm.org/Immunization/whatworks.html)

**Standard 14:** *Regular assessments of vaccination coverage rates are conducted in a provider's practice*  
Evidence shows that assessment of vaccination coverage and provision of the results to the staff in a practice improves vaccination coverage among adults. Optimally, such assessments are performed annually. Provider assessment can be performed by the staff in the practice or by other organizations including state and local health departments. Effective interventions that include assessment and provision of results also may incorporate incentives or comparing performance to a goal or standard. This process is commonly referred to as AFIX (Assessment, Feedback, Incentives, and Exchange of Information). Coverage should be assessed regularly so that reasons for low coverage in the practice, or in a sub-group of the patients served, can be identified and interventions implemented to address them.

Information about this strategy and its implementation is available on CD-ROM and can be ordered on the internet: [www.atpm.org/Immunization/whatworks.html](http://www.atpm.org/Immunization/whatworks.html)

Software to assist in conducting coverage rate assessments and feedback is available at: [www.cdc.gov/nip](http://www.cdc.gov/nip)

### **Partner with the Community**

**Standard 15:** *Patient-oriented and community-based approaches are used to reach target populations*  
Vaccination services should be designed to meet the needs of the population served. For example, interventions that include community education, along with other components, such as extended hours, have been demonstrated to improve vaccination coverage among adults. Vaccination providers can work with partners in the community, including other health professionals (e.g., pharmacists), vaccination advocacy groups, managed care organizations, service organizations, manufacturers, and state and local health departments to determine community needs and develop vaccination services to address them.



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## Endorsements

Advisory Committee on Immunization Practices

Albert B. Sabin Vaccine Institute

Ambulatory Pediatric Association

American Academy of Family Physicians

American Academy of Pediatrics

American Academy of Physician Assistants

American College of Emergency Physicians

American College of Osteopathic Pediatricians

American College of Preventive Medicine

American Medical Association

American Nurses Association

American Osteopathic Association

American Public Health Association

Association of Immunization Program Managers

Association of Maternal and Child Health Programs

Association of State and Territorial Health Officials

Center for Pediatric Research

Centers for Medicare and Medicaid Services

Council of State and Territorial Epidemiologists

Every Child by Two

Health Resources and Services Administration

Immunization Action Coalition

Infectious Diseases Society of America

National Alliance for Hispanic Health

National Asian Women's Health Organization

National Assembly on School-Based Health Care

National Association for City and County Health Officials

National Association for Pediatric Nurse Practitioners

National Association of School Nurses

National Coalition for Adult Immunization

National Foundation for Infectious Diseases

National Institute of Allergy and Infectious Diseases

National Medical Association

National Network of Immunization Nurses and Associates

National Partnership for Immunization

National Perinatal Association Partnership for Prevention

Pediatric Infectious Disease Society

Project Immunize Virginia

Society for Adolescent Medicine

Society for Teachers of Family Medicine

Vaccine Education Center at the Children's Hospital of Philadelphia

## The National Vaccine Advisory Committee (NVAC)

### Committee History

The National Vaccine Advisory Committee (NVAC) was chartered in 1988 to advise and make recommendations to the director of the National Vaccine Program and the assistant secretary for health, Department of Health and Human Services, on matters related to the prevention of infectious diseases through immunization and the prevention of adverse reactions to vaccines.

The NVAC is composed of 15 members from public and private organizations representing vaccine manufacturers, physicians, parents, and state and local health agencies. In addition, representatives from governmental agencies involved in health care or allied services serve as ex-officio members of the NVAC.

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## Essential Public Health Services

*"The individuals who work in public health have entered the field from many professional disciplines—medicine, nursing, law, dentistry, teaching, social work, and even the ministry. When there's a straightforward task to be done—inspecting restaurants, handing out a WIC voucher, or checking vital signs—it's easy for everyone to see the purpose of public health and understand it. It's much harder for staff to understand the "why" of public health—why we give immunizations, why community assessments are important, and how all the work of public health is interconnected."*

- Local health department director

The U.S. public health workforce consists of approximately 500,000 individuals currently employed by a range of organizations involved in public health practice, including governmental public health agencies, other public sector agencies, health care delivery organizations, voluntary organizations, community-based groups, academia, and other entities. The public health workforce is defined less by where they work than by what they do, which is to provide essential public health services to communities throughout the nation. The essential services were listed in a statement, *Public Health in America* in 1994.

The Public Health Functions Steering Committee, comprising representatives of several national organizations and federal agencies involved in public health, developed *Public Health in America* as a consensus statement "to explain what public health is; clarify the essential role of public in the overall health system; and provide accountability by linking public health performance to health outcomes." The statement provides a common vision for public health, "**Healthy People in Healthy Communities**" as well as a mission, "**To promote physical and mental health and prevent disease, injury and disability.**" The Essential Public Health Services provides a list of ten public health services that define the practice of public health. (Table 1)

Since 1994, there is momentum around using the Essential Services framework. It has already been proven to be valuable in assessing organizational capacity, job performances and expenditures. There is more work needed to increase the usefulness of this framework. One promising area is the use of the essential services to identify the general knowledge, skills and abilities (i.e., core competencies) that are needed by public health workers regardless of where they work or their specific role, background or programmatic responsibility. Examples of core competencies include epidemiology, health communications/social marketing, community needs assessment, and mobilization.

As one state health director explained, *"Historically, we've generally done a good job of tasks like screening children or treating STDs and TB. We haven't done as well with some other tasks critical to improving the public's health, because our people lack the skills to convene and talk to community groups, analyze and explain data, sit at a policy table, or assess community needs."* It has been estimated that almost 4 out of 5 public health workers nationwide are under trained in the disciplines of public health. A major challenge in the 21st century will be to ensure that all public health workers have access to the training and continuing education needed to perform the essential services. Your participation in "Epidemiology and Prevention of Vaccine Preventable Diseases" contributes directly to competent delivery of the essential services of public health. As part of the public health team, your role is broad and more complicated than just providing personal health services. You are helping the community create conditions in which everyone can be healthy.

To learn about the **Public Health Functions Project**, visit their website at <http://web.health.gov/phfunctions>

Table 1. Ten Essential Public Health Services

- 1** **Monitor health** status to identify community health problems.
- 2** **Diagnose and investigate** health problems and health hazards in the community.
- 3** **Inform, educate and empower** people about health issues.
- 4** **Mobilize community partnerships** to identify and solve health problems.
- 5** **Develop policies and plans** that support individual and community health efforts.
- 6** **Enforce laws** and regulations that protect health and ensure safety.
- 7** **Link people to** needed personal health **services and** assure the provision of health **care** when otherwise unavailable.
- 8** **Assure a competent** public health and personal health workforce.
- 9** **Evaluate** effectiveness, accessibility, and quality of personal and population-based health services.
- 10** **Research** for new insights and innovative solutions to health problems.

Public Health Functions Steering Committee, Public Health in America, July 1995



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## Special Communication

# Adult Immunization

## Summary of the National Vaccine Advisory Committee Report

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In January 1994 the National Vaccine Advisory Committee adopted a report that reviewed the status of adult immunization in the United States. Vaccine-preventable infections of adults represent a continuing cause of morbidity and mortality. Their major impact is among older persons. Effective and safe vaccines against these diseases are available, but they are poorly used. Several reasons account for low immunization levels among adults, including inadequate awareness by health care providers and the public of the importance and benefits of vaccination. Health care providers often fail to take advantage of opportunities to immunize adults during office, clinic, and hospital contacts and fail to organize programs in medical settings that ensure adults are offered the vaccines they need. Inadequate reimbursement for adult immunization by public and private health insurers and a lack of federal programs to support vaccine delivery are also major problems. The National Vaccine Advisory Committee's report includes five goals and 18 recommendations for improving adult immunization. To reach the Public Health Service adult immunization goals for the year 2000, the Committee recommends (1) improvements in public and provider education; (2) major changes in clinical practice; (3) increased financial support by public and private health insurers; (4) improved surveillance of vaccine-preventable diseases and vaccine production and delivery; and (5) support for research on vaccine-preventable diseases, new and improved vaccines, immunization practices, and international programs for adult immunization.

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IMMUNIZATION programs in the United States have dramatically reduced the occurrence of many childhood infectious diseases (Table 1).<sup>1,2</sup> Diphtheria and childhood tetanus have practically disappeared, and fatal cases of pertussis (whooping cough) are rare.<sup>3</sup> No cases of indigenous poliomyelitis have been reported since 1979.<sup>4</sup> The occurrence of measles has been substantially reduced.<sup>5</sup> Cases of childhood rubella are rarely observed, and there are few reports of congenital rubella syndrome.<sup>6</sup> Childhood mumps is seldom encountered by physicians.<sup>7</sup> The recent extraordinary decline in *Haemophilus influenzae* type b meningitis is largely attributable to widespread use of *Haemophilus influenzae* type b vaccines.<sup>8</sup> Nonetheless, the reemergence of measles during the period 1989 through 1991,<sup>9</sup> the persistence of congenital rubella syndrome,<sup>6</sup> and lingering questions about the safety of pertussis vaccine<sup>3</sup> are sobering reminders that control of vaccine-preventable childhood diseases requires constant vigilance. Our nation has responded with an unhesitating commitment of resources

to expand our immunization efforts, most notably the president's Childhood Immunization Initiative.<sup>10</sup>

The contrast between the impact of vaccine-preventable diseases of adults compared with those of children is striking. Each year, fewer than 500 persons in the United States die of vaccine-preventable diseases of childhood. By comparison, 50 000 to 70 000 adults die of influenza, pneumococcal infections, and hepatitis B (Table 2).<sup>11</sup> In addition, many childhood vaccine-preventable infections are now found among young adults. Outbreaks of measles,<sup>9,12</sup> rubella,<sup>13</sup> and mumps<sup>14</sup> have caused major disruptions on college campuses, in the workplace, and in institutions such as hospitals and prisons. Vaccine-preventable diseases remain an important cause of costly hospitalization, especially among the elderly.<sup>15</sup>

Currently, 98% or more of American children are fully immunized by the time of school entry.<sup>1</sup> Although in some communities the proportion fully immunized by 2 years of age is much lower, several programs have been established to address this problem.<sup>16</sup> In contrast, and in spite of the much heavier burden of disease, vaccines that are recommended for adults are not widely used (Table 2).<sup>11</sup> Several reasons have been given to ex-

plain this. First, there is a limited perception on the part of both health care providers and the general public that adult vaccine-preventable diseases are significant health problems. Second, there are doubts in the minds of some health care providers and the public about the efficacy and safety of several of the vaccines used for adults. Third, adult immunization is selective not universal; different vaccines have different target groups (Table 3). Fourth, the sizes of the adult target populations for individual vaccines vary and for some vaccines are much larger than the target population for childhood vaccination. Fifth, unlike the childhood vaccination schedule that must be completed if children are to enter school, there are no statutory requirements for adult immunization. Sixth, unlike the child health care practices in most communities, there are few programs in either the public or private sectors for vaccinating adults. Finally, reimbursement for adult immunization has traditionally been neglected by both government and private insurers; children can usually obtain inexpensive or free vaccines from public health clinics, but until recently most adults have had to pay the full costs for most of their vaccines. The public availability of vaccines, school entry vaccination requirements, and responsible parenting have given our nation a high level of childhood immunization. In the best of circumstances, it would be difficult to achieve the same for adults.

In spite of these problems, adult immunization has not been ignored. More than 10 years ago two new vaccines for adults were licensed: pneumococcal vaccine in 1977 and hepatitis B vaccine in 1983. The 1980s brought many new initiatives to promote adult immunization, including those of the Advisory Committee on Immunization Practices,<sup>16,17</sup> the American College of Physicians,<sup>18</sup> the Infectious Diseases Society of America,<sup>19</sup> and the US Preventive Services Task Force.<sup>19</sup> In 1988 the Health Care Financing Administration (HCFA) launched its Medicare Influenza Vaccine Demonstration.<sup>20</sup> During the next 4 years, close to \$69 million was spent in a multifaceted program to increase influenza vaccination among Medicare enrollees and to evaluate its cost-effectiveness and health benefits.

A complete list of committee members appears at the end of this article.  
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Table 1.—Reported Cases of Vaccine-Preventable Childhood Diseases in the United States\*

Disease	Maximal No. of Cases (y)	1993 Cases†	Reduction, %
Diphtheria	206 939 (1921)	0	-100.0
Pertussis	265 269 (1934)	6132	-97.7
Tetanus‡	1560 (1923)	9	-99.4
Poliomyelitis (paralytic)	21 269 (1952)	0§	-100.0
Measles	894 134 (1941)	277	-99.9
Rubella	57 686 (1969)	188	-99.7
Congenital rubella syndrome	20 000 (1964-1965)	7	-99.9
Mumps¶	152 209 (1968)	1630	-98.9

\*Data from the National Immunization Program, Centers for Disease Control and Prevention (CDC), Atlanta, Ga.

†Provisional data that may change because of late reporting.

‡Data from the CDC on tetanus refer to deaths not cases; CDC does not have information on the numbers of reported tetanus cases before 1947. The number of reported deaths refers to 1992. Mortality data for 1993 are not available. The provisional number of tetanus cases reported for 1993 is 42.

§Excludes an estimated four cases of vaccine-associated paralysis.

||Rubella first became a reportable disease in 1966.

¶Mumps first became a reportable disease in 1968.

Table 2.—Estimated Effect of Full Use of Vaccines Currently Recommended for Adults\*

Disease	Estimated Annual Deaths, No.	Estimated Vaccine Efficacy, %†	Current Vaccine Utilization, %‡	Additional Preventable Deaths per y, No.§
Influenza	20 000	70	41	8260
Pneumococcal infection	40 000	60	20	19 200
Hepatitis B	5000	90	10¶	4050
Tetanus-diphtheria	<25	99	40#	<15
Measles, mumps, and rubella	<30	95	Variable	<30
Travelers' diseases**	<10	...††	...	<10

\*Adapted from Gardner and Schaffner.<sup>11</sup>

†Indicates efficacy in immunocompetent adults. Among elderly and immunocompromised patients, estimated efficacy may be lower.

‡The percentage of targeted groups who have been immunized according to current recommendations. Rates vary among different targeted groups. Data for influenza and pneumococcal vaccines were obtained from the 1991 National Health Interview Survey and apply to persons 65 years of age or older.

§Calculated as follows: (potential additional vaccine utilization) × (estimated vaccine efficacy) × (estimated annual deaths).

||Variable (range, 0 to 40 000).

¶Highly variable (range, 1% to 60%) among different targeted groups.

#This estimate is based on seroprevalence data.

\*\*Travelers' diseases include cholera, typhoid, Japanese encephalitis, yellow fever, poliomyelitis, and rabies.

††Ellipses indicate not applicable.

Discussion of how to improve adult immunization must be included in the debate over health system reform in the United States. Vaccine-preventable diseases of adults impose significant health care costs on the nation. Yet, there is strong evidence that adult immunization is highly cost-effective.<sup>11,18</sup> Thus, the choice we face is not simply deciding whether to pay for adult immunization, it is whether to pay more for the costs of treating unprevented illness or less for preventing it from occurring in the first place.

In January 1994 the National Vaccine Advisory Committee (NVAC) adopted a report that reviewed the status of adult immunization in the United States.<sup>21</sup> This article summarizes the NVAC report, including the committee's goals and recommendations (Table 4).

#### 1. INCREASE THE DEMAND FOR ADULT VACCINATION BY IMPROVING PROVIDER AND PUBLIC AWARENESS

In 1980 the surgeon general recommended that by 1990 60% of all elderly and high-risk persons should be immunized with influenza and pneumococcal

vaccines and 50% of target groups for new vaccines (eg, hepatitis B vaccine) should be vaccinated within 5 years of vaccine licensure.<sup>22</sup> In 1990 these goals had not been reached.

Surveys conducted during the 1980s showed that physicians generally understood the importance of vaccine-preventable diseases and knew about the efficacy and safety of vaccines recommended for adults. However, they often failed to translate their knowledge into clinical practice.<sup>23</sup> Several studies demonstrated that good administration and organization were the keys to the success of vaccination programs.<sup>24</sup> Although specific details varied, for each successful program a decision had been made to establish an organized approach for offering vaccines to adults on a regular basis.

Better public understanding of the seriousness of vaccine-preventable diseases and the benefits of vaccination is essential.<sup>16,18</sup> Many elderly patients fail to appreciate that influenza presents a risk of severe illness that may lead to hospital admission or death.<sup>25</sup> Most elderly patients have no knowledge of the frequency or severity of pneumococcal infections. Few

young adults who have multiple sexual partners understand their risks for acquiring hepatitis B. Many adults are unaware of the clinical effectiveness and safety of the vaccines that can prevent these diseases. Educational programs can help increase public understanding of the need for and benefits of adult immunization. This was illustrated recently during the HCFA Medicare Influenza Vaccine Demonstration, when a letter sent to Medicare enrollees by the HCFA administrator was helpful in persuading older persons to get vaccinated.<sup>24</sup>

The NVAC recommends that educational programs be undertaken to improve the adult immunization practices of physicians and other health care providers. These programs should emphasize widespread dissemination of the goals and recommendations for adult immunization, periodic assessment of provider knowledge and attitudes about vaccines and immunization practices, and better understanding of the administrative and organizational features of successful vaccination programs. Greater emphasis should be given to adult immunization in professional education and certification, and more attention should be devoted to practical approaches for vaccine delivery in training programs, including appropriate immunization of students and trainees themselves. The committee recommends that the public also be better informed of the importance of vaccine-preventable diseases of adults and of the safety and benefits of immunization. This will require an understanding of factors that constitute barriers or promote easy access to vaccination services. The committee recommends educational programs and media campaigns for adult immunization, especially those that are linked to announcements routinely directed to target populations by government agencies and community organizations.

#### 2. ASSURE THAT THE HEALTH CARE SYSTEM HAS AN ADEQUATE CAPACITY TO DELIVER VACCINES TO ADULTS

An efficacious vaccine will be effective in preventing disease only if it is given to those who will benefit. The importance of vaccine delivery has been dramatically demonstrated by the contributions of the Centers for Disease Control and Prevention (CDC) to childhood immunization. Approximately half of all children in the United States are immunized through state and local public health programs that use vaccines purchased under federal contracts negotiated by the CDC.<sup>1</sup> Studies by CDC investigators on the epidemiology of vaccine-preventable diseases, the susceptibility of children to infection, and the shortcomings of vaccine delivery pro-



Table 3.—Vaccines and Toxoids Recommended for All Adults\*

Age Group, y	Influenza (Annually)	Pneumococcal	Measles	Rubella	Mumps	Td†
18-24	...	...	X	X	X	X
25-64	...	...	X‡	X	X§	X
≥65	X	X	...	...	...	X

\*Adapted from Centers for Disease Control.<sup>18</sup> This report should be consulted for detailed recommendations on immunizing adults who have high-risk medical conditions; who are immunocompromised; who have special occupations, lifestyles, or environmental circumstances; or who are travelers, foreign students, immigrants, or refugees. Ellipses indicate vaccine or toxoid not universally recommended for all adults.

†Tetanus and diphtheria toxoids adsorbed (for adult use).

‡One dose of measles vaccine is indicated for persons born after 1956. A second dose is indicated for persons born after 1956 who are entering health care employment, those who are students in postsecondary educational institutions, and those who are planning international travel.

§Indicated for persons born after 1956.

grams provide the basis for the Childhood Immunization Initiative.<sup>10</sup> This research has shown that the majority of children and adults who develop vaccine-preventable illnesses have been seen previously by health care providers and could have been vaccinated at the time but were not.<sup>26</sup> Such "missed opportunities" for vaccination have several causes, including misconceptions about contraindications to vaccination and the lack of an organized approach to offering vaccines. The failure to prevent vaccine-preventable diseases is far more often due to the failure to vaccinate rather than to the failure of the vaccines themselves. The costs of these "missed opportunities" are very high.

Most vaccines given to adults are administered by generalist physicians, yet wide variations have been shown in their immunization practices.<sup>18,22</sup> Many adults who should be vaccinated receive their principal care from specialists rather than general physicians or from highly specialized teams of health care professionals or administrative units such as clinics. In such settings, a single focus of responsibility for offering vaccines is often difficult to identify. Thus, efforts to improve adult immunization must focus on developing workable systems for regularly offering vaccines to patients at risk, regardless of where they receive their care. Such systems should reflect practice guidelines, and their evaluation should become a common feature of quality assurance and accreditation programs.

The NVAC recommends that the CDC and other federal agencies assume increased responsibility for assuring that adults are appropriately immunized. This will require support for vaccine purchase and program administration at the state and local levels, as well as increased staff and support at the CDC itself. The committee urges that all health care providers, whether generalists or specialists, consider any contact with adult patients as an opportunity to provide recommended vaccines. The committee recommends that health care providers and the institutions in which they practice adopt administrative and organizational arrangements that

guarantee the regular offering of vaccines to adults, develop and implement standards and practice guidelines for adult immunization, and include regular evaluation of immunization practices as part of their quality assurance programs.

### 3. ASSURE ADEQUATE FINANCING MECHANISMS TO SUPPORT THE EXPANDED DELIVERY OF VACCINES TO ADULTS

Childhood immunization programs have long received financial support from federal, state, and local governments. Public agencies have been much less involved with adult immunization; in 1991 less than 10% of all doses of influenza and pneumococcal vaccines used in the United States were given by state and local health departments (CDC, unpublished data, 1993). To address this problem, in 1981 the Congress instructed the HCFA to pay physicians for pneumococcal vaccination of elderly patients under Part B of the Medicare program.<sup>23</sup> In 1984 reimbursement for hepatitis B vaccination was added for Medicare patients with end-stage renal disease. In 1993 Medicare was authorized to pay for influenza vaccine and its administration.<sup>21</sup>

The implementation of Medicare reimbursement for vaccination has not measured up to its promise. For example, Medicare reimbursement for pneumococcal vaccination during the 1980s barely covered the cost of the vaccine alone.<sup>23</sup> Each year during the period 1985 through 1988, only 300 000 to 400 000 doses of pneumococcal vaccine—25% of all doses distributed nationwide—could be accounted for by the Medicare reimbursement program. Whether adequate reimbursement is important for adult immunization should become apparent in Medicare's recently established program to pay for annual influenza vaccination.

There is little information on the extent to which private health insurance companies provide coverage for adult immunization. Health maintenance organizations may provide such services, but their immunization rates are often no better than those of patients covered by tra-

ditional health insurance.<sup>26</sup> Reliance on regulatory approaches to improve private health insurance coverage of adult immunization may not be sufficient; businesses that self-insure their employees are not subject to regulation by state governments. Proposals for health system reform usually include coverage of childhood immunization. Similar coverage is needed for adult immunization.

The NVAC recommends that publicly funded health insurance programs adequately reimburse providers for the costs of vaccines and their administration to adults. Medicare and Medicaid reimbursement policies must be monitored to ensure that they are effectively implemented by fiscal intermediaries and providers alike. When problems are identified, technical assistance must be provided and financial or other incentives considered so that adults enrolled in these programs are appropriately immunized. Similarly, the committee recommends that private health insurance companies adequately reimburse providers for adult immunization, without requiring individual co-payments or deductibles. Business and labor leaders and state health insurance regulators should encourage inclusion of adult immunization as a cov-

Table 4.—The National Vaccine Advisory Committee's Goals and Recommendations for Adult Immunization\*

1. Increase the demand for adult vaccination by improving provider and public awareness
  - Conduct effective information programs for
    - Health care providers to improve their immunization practices
    - The public to emphasize the importance of vaccine-preventable diseases and the safety and benefits of immunization
2. Assure the health care system has an adequate capacity to deliver vaccines to adults
  - Establish an adult immunization grant program to assist state and local health departments
  - Reduce missed opportunities for vaccination
  - Appropriately vaccinate adult patients in
    - Primary care settings
    - Specialty practices and institutions
  - Implement guidelines and standards for adult immunization practice
3. Assure adequate financial mechanisms to support the expanded provision of vaccines to adults
  - Adequately reimburse providers through
    - Publicly funded programs such as Medicare and Medicaid
    - Private health insurance
  - Include coverage for adult immunization in national health system reform
4. Monitor and improve the performance of the nation's vaccine delivery system
  - Expand programs for disease surveillance
  - Preserve and strengthen vaccine-manufacturing capacity to meet the nation's needs
  - Endeavor to achieve the adult immunization goals of *Healthy People 2000*
5. Assure adequate support for research
  - Support research on
    - Adult vaccine-preventable diseases
    - Efficacy, safety, clinical effectiveness, and cost-benefit/cost-effectiveness of adult immunization
    - Epidemiology of adult immunization practices
    - New and improved vaccines
    - International programs for adult immunization

\*From National Vaccine Advisory Committee.<sup>21</sup>



ered benefit for those insured. Finally, the committee strongly recommends that all national health system reform proposals include coverage for adult immunization services and provide mechanisms to finance their delivery.

#### 4. MONITOR AND IMPROVE THE PERFORMANCE OF THE NATION'S VACCINE DELIVERY SYSTEM

The nation's ability to control vaccine-preventable diseases requires continuing surveillance of the diseases themselves, an assured manufacturing capacity to provide the vaccines needed, and periodic assessment of whether the vaccines are reaching the persons for whom they are intended.

The effective and efficient use of vaccines in adults depends on a clear understanding of which diseases are epidemiologically important and which persons are at risk of infection. The CDC works closely with state and local health departments to monitor the occurrence of vaccine-preventable diseases. For example, it regularly provides timely advice on the identity of influenza viruses causing outbreaks and information on whether the current influenza vaccine should be protective.<sup>27</sup> Surveillance by the CDC has provided better understanding of the epidemiology of hepatitis B<sup>28</sup> and pneumococcal infections.<sup>29</sup> These programs could be improved if inexpensive methods were developed for more rapid diagnosis of disease. Surveillance is also essential for accurately assessing the economic impact of vaccine-preventable diseases.

The success of our nation's immunization programs depends on the capacity of our vaccine manufacturers to produce and distribute a constant supply of vaccine products. During the swine influenza program in 1976, our system for vaccine supply was severely tested.<sup>30</sup> In the 1980s liability costs contributed to the rise in prices for childhood vaccines and seriously threatened the economic viability of vaccine manufacturers.<sup>31</sup> The National Vaccine Injury Compensation Program, established in 1986, provides a mechanism by which claims for childhood vaccine-associated injuries can now be settled.<sup>32</sup> Although its implementation has been costly and not without problems, the program has succeeded in stabilizing the market for the vaccine manufacturers.

One reason why the 1990 goals for adult immunization were not reached may be the failure to monitor adult immunization practices. In 1989 the National Center for Health Statistics began to gather better information on vaccination levels against influenza, pneumococcal disease, tetanus, and diphtheria. Its National Health Interview Survey has shown, for example,

that only 20% of elderly persons have ever received pneumococcal vaccine.<sup>33</sup> However, little is known about geographic variations in the use of this vaccine or about vaccination rates in persons at increased risk of disease. For hepatitis B vaccine, a great deal is known about vaccination status of health care workers, but almost nothing is known about the status of the other high-risk groups that account for more than 95% of all cases of the disease.<sup>34</sup>

The NVAC recommends that surveillance of vaccine-preventable diseases by the CDC and by state and local health agencies be strengthened, including the development of better methods of diagnosing disease. The committee recommends that the capacity of the nation's vaccine manufacturers to meet current and future needs for vaccines be periodically assessed to identify potential technical, regulatory, financial, legal, or political problems that could threaten adequate supplies of vaccines for adult immunization. This assessment should also determine the appropriate level of federal involvement in vaccine purchase, production, and compensation for vaccine-related adverse events. To reach the adult immunization goals of *Healthy People 2000*, the committee recommends more detailed evaluation of vaccination levels in adults with specific high-risk conditions and in specific population groups at risk. It also recommends support for programs to improve vaccine delivery where immunization rates are found to be unsatisfactory. (The adult immunization goals of *Healthy People 2000* provide for increases in immunization levels as follows: (1) pneumococcal pneumonia and influenza immunization among institutionalized chronically ill or older people to at least 80%; (2) pneumococcal pneumonia and influenza immunization among non-institutionalized, high-risk populations as defined by the Advisory Committee on Immunization Practices to at least 60%; and (3) hepatitis B immunization among high-risk populations, including infants or surface antigen-positive mothers, to at least 90%; occupationally exposed workers to at least 90%; intravenous-drug users in drug treatment programs to at least 50%; and homosexual men to at least 50%.)

#### 5. ASSURE ADEQUATE SUPPORT FOR RESEARCH

Basic research on the viruses and bacteria that cause disease is essential if we are to develop new and improved vaccines.<sup>34</sup> Equally important is research on host responses to infection and vaccination, especially the responses of older adults whose immune systems become less responsive with advancing age. For each vaccine, initial evaluation of its ef-

ficacy must be followed by an assessment of its clinical effectiveness in preventing the more serious and costly outcomes of disease. In addition, much more needs to be known about the health and economic consequences of vaccine-preventable diseases. The cost-effectiveness of adult immunization must be further assessed; current evidence suggests that influenza and pneumococcal vaccination are highly cost-effective when compared with other preventive, screening, and treatment interventions in common use among elderly persons.<sup>35</sup> New knowledge about the epidemiology of vaccine-preventable diseases must be accompanied by research on the epidemiology of efforts to prevent these diseases, including variations in the vaccination practices of health care providers. The importance of this research is illustrated by a recent study showing that persons at greatest risk of influenza were least likely to be vaccinated.<sup>35</sup>

Research has provided several new and improved vaccines that may benefit adults, including cold-adapted live influenza, pneumococcal conjugate, varicella-zoster, hepatitis A, and acellular pertussis vaccines.<sup>18,34</sup> Promising new methods of vaccine administration are being developed, including newer adjuvants, epitope-based strategies that reflect an understanding of antigen recognition sites, particulate antigens delivered as microcapsules, glycoconjugate preparations, immunologic boosting with cytokines and lymphokines, and the use of vaccine vectors.

Whether adults in the United States are to be protected against vaccine-preventable diseases will depend to some extent on the occurrence of these diseases in other parts of the world. Current international programs for monitoring diseases such as influenza need to be supplemented by surveillance programs for other emerging and reemerging infectious diseases, such as diphtheria in countries of the former Soviet Union,<sup>36</sup> a new strain of *Vibrio cholerae* in South Asia,<sup>36</sup> and the spread of antimicrobial-resistant *Streptococcus pneumoniae* in many countries.<sup>37</sup> International disease surveillance and vaccination programs have already paid rich dividends in the worldwide eradication of smallpox and the elimination of poliomyelitis in the Americas. Given the promise of new and improved vaccines, the Children's Vaccine Initiative has become the organizing focus to coordinate the transfer of new technologies for vaccine production and vaccine delivery to developing countries.<sup>38</sup> Many aspects of this program have direct implications for the development of new and improved vaccines for adults.

The NVAC recommends continued support of research on the microbiologi-



cal agents of and the host response to vaccine-preventable infections, including those of immunocompromised and aging individuals. The committee urges the development of better measures of the health and economic consequences of current and future vaccine-preventable diseases. The committee recognizes that the viability of our nation's adult immunization programs requires continued evidence of the efficacy, effectiveness, safety, and cost-effectiveness of current and future vaccines. The committee recommends greater attention be given to studies of the epidemiology of immunization practices. Research on new and improved vaccines for use in the United States and internationally must be assured stable and continuing support. Finally, the committee encourages greater collaboration between federal agencies, nongovernmental organizations, professional associations, and vaccine companies in the United States and their counterparts in international organizations and in countries throughout the world.

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#### CONCLUSION

In making its recommendations, the NVAC recognizes that none of its goals for adult immunization will be reached without giving attention to all. The task is complex and the effort and resources needed to achieve success will be substantial. However, in undertaking this work, the committee is reminded that our nation's programs for childhood immunization have reduced the costs of health care and improved the well-being of all our children. We can and should expect no less from our efforts to immunize adults.

The National Vaccine Program was established in 1986 by the Public Health Service Act to achieve optimal prevention of infectious disease through immunization and optimal prevention of adverse reactions to vaccines. The program is responsible for coordination and direction of government and nongovernment activities on research, licensing, production, distribution, and use of vaccines. The director is the assistant secretary for health, with the National Vaccine Advisory Committee serving as advisor. The committee consists of 16 voting members appointed by the director, in consultation with the Na-

tional Academy of Sciences, including individuals in vaccine research or manufacture, physicians, members of parent organizations, and representatives of health agencies and public health organizations. The committee also includes five nonvoting members from the National Institutes of Health, the Food and Drug Administration, the Centers for Disease Control and Prevention, the Agency for International Development, and the Department of Defense.

Members of the National Vaccine Advisory Committee are as follows:

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