11. Vaccination Programs

Updates

The major revision to this section is the addition of language related to Affordable Care Act (1) coverage of adult vaccination.

General Principles

Universal vaccination is a critical part of quality health care and should be accomplished through routine and catch-up vaccination provided in physicians' offices, public health clinics, and other appropriate settings. In the United States, vaccination is considered primarily the responsibility of individual health care providers and health care systems serving patients.

Certain programs and other efforts attempt to ensure all patients receive the full schedule of appropriate vaccinations by removing barriers posed by access to immunizations, cost, or other factors. Such efforts may include school-located clinics, school-based health centers, back-to-school immunization clinics, public health clinics for schoolchildren, periodic influenza vaccination clinics, public health nurse tracking of childhood immunizations, and government-sponsored financing of vaccines through the Vaccines for Children and Section 317 program (www.cdc.gov/vaccines/hcp/admin/vfc.html).

In the United States, vaccination programs have eliminated many vaccine-preventable diseases and markedly reduced the incidence of others (2). Because infants and young children were the principal recipients of most vaccines developed during the twentieth century (e.g., poliovirus vaccine), many persons in the United States might believe that vaccinations are solely for the young; however, vaccinations are recommended for persons of all ages (3,4). Improved vaccination coverage can result in additional reductions in the incidence of vaccine-preventable diseases that affect persons throughout the life span, and decrease associated morbidity and mortality.

Vaccination of Children and Adolescents

Physicians and other pediatric vaccination providers should adhere to the standards for child and adolescent vaccination practices (5). These standards are published by the National Vaccine Advisory Committee and define appropriate vaccination practices for both public and private sectors. The standards provide guidance on practices that eliminate barriers to vaccination, including eliminating unnecessary prerequisites for receiving vaccinations, eliminating missed opportunities to vaccinate, improving procedures to assess vaccination needs, enhancing knowledge about vaccinations among parents and providers, and improving management and reporting of adverse events. In addition, the standards address the importance of recall and reminder systems and using assessments to monitor clinic or office vaccination coverage levels. Health-care providers should simultaneously administer as many vaccine doses as possible as indicated on the *Recommended Immunization Schedules for Persons Aged 0 Through 18 Years* (3).

While rates of childhood vaccination are generally higher than rates of adult vaccination, for some doses coverage rates are still low, like the birth dose of hepatitis B vaccine. Community health-care providers, as well as state and local public health vaccination programs, should coordinate with partners to identify and maximize outreach to populations at risk for undervaccination and vaccine-preventable diseases. For example, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a categorical federal grant program administered by the U.S. Department of Agriculture through state health departments. The program provides supplemental foods, health-care referrals, and nutrition education to low-income pregnant, breastfeeding, or postpartum women, as well as to infants and children aged <5 years. Between 8.5 and 8.9 million people participated in this program in 2013 (www.fns.usda.gov/pd/wic-program). In collaboration, WIC and state vaccination programs assess regularly the vaccination coverage levels of WIC participants and develop new strategies and aggressive outreach procedures in sites with coverage levels <90%. Vaccination programs and private providers are encouraged to refer eligible

children to obtain WIC nutritional services, at www.fns.usda.gov/wic/immunization-screening-and-referral-wic (6).

Adolescent-Specific Issues

Vaccinations are recommended throughout life, including during adolescence. The age range for adolescence is defined as 11-21 years by many professional associations, including the American Academy of Pediatrics and the American Medical Association (7,8). Definitions of these age cutoffs differ depending on the source of the definition and the source's purpose for creating a definition. Vaccination of adolescents is critical for preventing diseases for which adolescents are at particularly high or increasing risk, such as meningococcal disease and human papillomavirus infection. Three vaccines recommended for adolescents have been licensed since 2005: MenACWY and Tdap were licensed in 2005, and HPV was licensed in 2006. A second dose of varicella vaccine is recommended for persons who received 1 dose of varicella vaccine after age 12 months. In addition, annual seasonal influenza vaccination is recommended for persons aged >6 months who have no contraindications. To ensure vaccine coverage, clinicians and other health-care providers who treat adolescents must review vaccination history on every occasion that an adolescent has an office visit.

National goals for vaccination coverage for adolescents aged 13-15 years were included in *Healthy People 2020*, at www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases. Targets of 80% coverage were specified for one dose of Tdap, one dose of meningococcal conjugate vaccine, and 3 doses of HPV vaccine. Results of the published 2014 National Immunization Survey—Teen indicate that coverage rates for 13-17 years olds is 87.6% for one dose of Tdap and 79.3% for one dose of meningococcal vaccine. Coverage rates for 13-17 years olds for HPV vaccine are considerably lower—39.7% for females and 21.6% for males (9,10).

Ensuring adolescents receive routine and catch-up vaccination and achieving high levels of vaccination coverage present challenges. In general, adolescents do not visit health care providers frequently. Health care providers should promote annual preventive visits (11), including one specifically for adolescents aged 11 and 12 years. The annual visits should be used as opportunities to provide routinely recommended vaccine doses, additional catch-

up doses needed for lapsed vaccine series, vaccines recommended for high-risk groups, additional doses that might have been recently recommended, and other recommended health-care services. Additional strategies include adolescent immunizations at community-based venues such as pharmacies and schools.

All vaccine doses should be administered according to ACIP vaccine-specific statements and with the most recent schedules for both routine and catch-up vaccination. Before leaving any visit for medical care, adolescents should be encouraged to schedule return visits for any additional vaccine doses needed. During visits that occur outside of influenza season, providers should discuss and recommend seasonal influenza vaccination and make explicit plans for vaccination, including timing and anticipated setting (e.g., health care provider's office, school, or pharmacy). Catch-up vaccination with multidose adolescent vaccines generally can occur according to the routine dosing schedule for these vaccines, although in some circumstances the clinician or health care provider might use minimum intervals for vaccine doses. These circumstances include an outbreak that increases risk for disease or the likelihood that doses will be missed in the future (e.g., because of transportation challenges). Because of lack of efficacy data for HPV vaccine administration using minimum intervals, providers are encouraged, when possible, to use routine dosing intervals for females aged 11-26 years and males aged 11-21 years who have not yet received 3 HPV vaccine doses as recommended (3,4).

One of the challenges of adolescent vaccination is ensuring that current, complete vaccination histories are available. Insurers, covered services, or reimbursement levels can change, and these changes might affect reimbursement for vaccine doses and vaccination services directly while also causing disruptions in an adolescent's access to vaccination providers or venues. In circumstances in which a vaccination record is unavailable, vaccination providers should attempt to obtain this information from various sources (e.g., parent, previous providers, or school records). More detail about how to obtain these records is available from CDC at www.cdc.gov/vaccines/hcp/admin/immuniz-records.html. With the exception of influenza and pneumococcal polysaccharide vaccines, if documentation of a vaccine dose is not available, the adolescent should be considered unvaccinated for that dose. Regardless of the venue in which an adolescent receives a dose of vaccine, that vaccine dose should be documented in the patient's chart or in an office log, and the information should be entered into an IIS. The adolescent also should be

provided with a record that documents the vaccination history.

Adult Vaccination

In 2013, the National Vaccine Advisory Committee published updated standards for adult vaccination (12). These standards are targeted to distinct groups involved in adult vaccination, including immunizing providers, non-immunizing providers, professional health-care organizations, and public health departments. All health-care providers, whether they provide immunizations or not, should incorporate immunization needs assessment into every clinical encounter, strongly recommend needed vaccine(s) and either administer vaccine(s) or refer patients to a provider who can immunize, stay up-to-date on, and educate patients about vaccine recommendations, implement systems to incorporate vaccine assessment into routine clinical care, and understand how to access immunization information systems (i.e., immunization registries) (12).

Vaccination rates in adults are considered suboptimal (13,14). New *Healthy People 2020* goals include specific subsets of adults, including institutionalized adults aged ≥18 years (for pneumococcal vaccines) and noninstitutionalized adults at high risk aged >18 years (for pneumococcal vaccines) (9).

The most substantial barrier to vaccination coverage is lack of knowledge about these vaccines among adult patients and adult providers. Other barriers are cost (incomplete Medicare coverage for recommended vaccines) (15) and the lack of financing mechanisms for newly licensed and recommended vaccines. Effective for private health insurance plans drafted or updated after September 2010, coverage for all immunizations that are included on the immunization schedule(s) must be covered without deductibles or co-pays, when delivered by an in-network provider. For this reason, cost may present less of a barrier to adult vaccination as time passes.

A common challenge for health-care providers is vaccinating adults with unknown vaccination records. In general (except for influenza and pneumococcal polysaccharide vaccines), adults should receive a vaccine dose if the dose is recommended and no record of previous administration exists. If an adult has a record of military service and does not have records available, providers can assume that the person has received all vaccines

recommended by the military at the time of service entry. Serologic testing might be helpful in clarifying immune status if questions remain, because at different times and depending on military assignments, there might be inter-service and individual differences.

Evidence-based Interventions to Increase Vaccination Coverage

The independent, nonfederal Task Force on Community Preventive Services, whose membership is appointed by CDC, provides public health decision-makers with recommendations on population-based interventions to promote health and prevent disease, injury, disability, and premature death. The recommendations are based on systematic reviews of the scientific literature about effectiveness and cost-effectiveness of these interventions. In addition, the task force identifies critical information about the other effects of these interventions, the applicability to specific populations and settings, and the potential barriers to implementation. Additional information, including updates of published reviews, is available from *The Community Guide* at http://www.thecommunityguide.org.

Beginning in 1996, the task force systematically reviewed published evidence on the effectiveness and cost-effectiveness of population-based interventions to increase coverage of vaccines recommended for routine use among children, adolescents, and adults. A total of 197 articles were identified that evaluated a relevant intervention, met inclusion criteria, and were published during 1980-1997. Reviews of 17 specific interventions were published in 1999 (13,14,16,17). Using the results of their review, the task force made recommendations about the use of these interventions (15). Several interventions were identified and recommended on the basis of published evidence. Follow-up reviews were published in 2000, and a review of interventions to improve the coverage of adults at high risk was conducted in 2005 (15,17). The interventions and the recommendations are summarized in this section of this report (Table 11-1). Interventions designated for adults younger than 65 years at high risk for influenza, invasive pneumococcal disease, and hepatitis B, include provider reminder systems or a menu of items (combinations of strategies) (Table 11-2). In 1997, the task force categorized vaccination requirements for child care, school, and college as a recommended strategy (14).

A 2008 update of the original task force systematic review of the evidence on the effectiveness of provider assessment and feedback for increasing coverage rates found that this strategy remains an effective intervention (18). This later update reviewed 19 new studies published during 1997-2007. The updated review supports the original task force recommendation for use of assessment and feedback based on strong evidence of effectiveness. The task force reviewed studies of assessment and feedback as a strategy that were conducted in a range of settings, including private practice, managed care, public health, community health settings, and academic centers. Studies have assessed the effectiveness of this intervention to improve coverage with MMR, DTP, DTaP, Hib, influenza, pneumococcal, and Td vaccines (16). The most updated information on this review is available at www.thecommunityguide.org/findings/vaccination-programs-provider-assessment-and-feedback. As recognized by the task force, routine assessment and feedback of vaccination rates obtained at the provider site is one of the most effective strategies for achieving high, sustainable vaccine coverage. Since 1995, all states receiving federal funds for vaccination programs have been required to conduct annual assessments of vaccination rates both in public health clinics and in private provider offices. Primarily to aid local and state health departments in their efforts to conduct assessments and assist providers, CDC has developed numerous software applications to measure vaccination rates in provider practices.

Other General Programmatic Issues

Programmatic challenges, evolving issues, and effective interventions related to adult and adolescent vaccination programs have been described by other advisory groups and expert groups. Additional evidence-based approaches are being developed for certain issues (e.g., settings for adolescent vaccination delivery) through ongoing research and evaluation. Among current programmatic challenges, vaccine financing is especially difficult because certain problems and solutions differ markedly from one state to another. Practitioners interested in beginning or continuing to provide vaccinations to patients are encouraged to consult with local and state public health vaccination programs to learn about publicly funded programs that might be available in their areas for patients who need vaccination but have insufficient health insurance coverage and no financial resources. If not already participating, providers who care for adolescents and children aged <19 years should

enroll in the Vaccines for Children Program (www.cdc.gov/vaccines/hcp/admin/vfc.html). Through this program's provision of ACIP-recommended, federally purchased vaccines, participating providers are able to fully vaccinate eligible children whose parents might not otherwise be able to afford the vaccinations. Interested providers are encouraged to work with insurers, state and specialty-specific medical organizations, vaccine manufacturers, and other stakeholders to address financial barriers to achieving high vaccination coverage. With availability of safe and effective vaccines for 18 vaccine-preventable diseases, the capacity for realizing the potential benefits of these products in the United States depends on reaching children, adolescents, and adults through dedicated, knowledgeable vaccination providers and efficient, strong vaccination programs at local, state, and federal levels.

TABLE 11-1. Recommendations regarding interventions to improve coverage of vaccines recommended for routine use among children, adolescents, and adults	
Intervention	**Recommendation**
Increase community demand for vaccination	
Client reminder or recall systems	Recommended
Requirements for entry to schools, child- care facilities, and colleges	Recommended
Community education alone	Insufficient evidence
Community-based interventions implemented in combination	Recommended
Clinic-based education	Insufficient evidence
Patient or family incentives	Recommended
Patient or family monetary sanctions	Insufficient evidence
Client-held medical records	Insufficient evidence
Enhance access to vaccination services	
Reducing out-of-pocket costs	Recommended
Enhancing access through the U.S. Department of Agriculture's Women, Infants, and Children (WIC) program	Recommended
Home visits, outreach, and case management targeted to particularly hard-to-reach populations to increase vaccination rates	Recommended
Enhancing access at schools	Recommended
Expanding access in health-care settings	Recommended as part of multicomponent interventions only
Enhancing access at organized child care centers	Recommended
Focus on providers	
Provider reminder or recall systems	Recommended

Provider assessment and feedback	Recommended
Standing orders	Recommended
Provider education alone	Insufficient evidence
Health-care systems-based interventions integrated in combination	Recommended
Immunization information systems	Recommended
Source: www.thecommunityguide.org/topic/vaccination.	

TABLE 11-2. Strategies to improve influenza, pneumococcal polysaccharide, and hepatitis B vaccine coverage among high-risk adults younger than 65 years	
One or both of these interventions to improve access to vaccination services	1. Expanded access in health-care settings 2. Reducing client out-of-pocket costs
PLUS: One or more of these provider or system based interventions	1. Standing orders 2. Provider reminder systems 3. Provider assessment or feedback
AND/OR: One or both of these interventions to increase client demand for vaccination services	1. Client reminder systems 2. Client education

Source (15)

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