

**Adolescent Vaccination: Recommendations from the
National Vaccine Advisory Committee – Adolescent Working Group**

Since 2005, three new vaccines have been licensed and recommended for adolescents, including tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap)¹, tetravalent meningococcal conjugate vaccine (MCV4)², and quadrivalent human papillomavirus vaccine (HPV).³ In response to a request by the Assistant Secretary for Health, the National Vaccine Advisory Committee (NVAC) adolescent working group recently assessed issues related to the goal of developing a comprehensive and successful adolescent immunization program in the United States.⁴ Six key areas were identified as presenting distinct challenges to realizing this goal, which is critical to the ultimate achievement of improved health outcomes among U.S. adolescents. These key areas include: venues for vaccine administration, consent for immunizations, communication, financing, surveillance, and the potential for school mandates. Having solicited input from over 40 stakeholders, the NVAC adolescent working group has developed recommendations for addressing five of these areas. Recommendations designed to address challenges associated with financing adolescent vaccines, as well as those associated with vaccines for infants and children, are being developed by a separate NVAC working group. Because some of the issues are inter-dependent, recommendations in some sections overlap. These recommendations are intended for health policy makers, immunization program managers, health care providers, and other stakeholders.

VENUE/HEALTH CARE UTILIZATION

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The American Academy of Pediatrics and other organizations recommend that all adolescents receive primary care within a medical home.⁵ We also believe that the medical home is an important venue for health care delivery, including immunizations, and that efforts need to be made to promote health care access, utilization of services, and availability of health insurance for adolescents. However, recent data suggest that, if unchanged, utilization patterns of preventive visits alone will not be sufficient to achieve high immunization coverage among adolescents.^{6,7} While younger adolescents have historically made more frequent preventive health care visits within traditional settings for care (i.e., pediatric and family practices), older adolescents have been observed to seek preventive care less frequently from traditional sources.^{6,8}

Identifying appropriate complementary settings for adolescent vaccination may be an important strategy for reaching adolescents who lack access to traditional sources of care. In order to reach as many adolescents as possible and maximize each encounter with a health care professional, we have developed recommendations for both the traditional medical home setting and potential complementary settings. Most of the recommendations will require partnerships (e.g. A-2), while some recommendations warrant immediate implementation by clinicians (e.g., A-1).

A. The Medical Home Setting

1. Promote and strengthen delivery of vaccination services in the medical home during both preventive care and, when not contraindicated, during non-preventive care visits.
 - a. All medical home visits by adolescents, including visits made by adolescents with minor acute illnesses⁹ (e.g., diarrhea, mild upper-respiratory tract infection with or without

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fever), should be considered opportunities for immunization and, if no immunizations are due, for counseling about upcoming immunizations.

- b. Immunizations should be administered at the earliest opportunity consistent with the harmonized ACIP/AAP/AAFP recommendations.
 - c. Health care professionals should simultaneously administer as many indicated vaccine doses as recommended.
 - d. All providers administering vaccinations to adolescents should participate in Immunization Information Systems (IIS). Participation of all vaccination providers will decrease the likelihood of adolescents' receiving unnecessary vaccine doses and will also reduce care fragmentation (e.g., for children who are transferring between providers or who may be receiving vaccinations in another setting such as the local health department).
2. Conduct research to identify effective strategies to increase utilization of recommended preventive health care visits and other opportunities that will promote adolescents' receipt of all immunizations as recommended by the ACIP.

B. Settings Complementary to the Medical Home

1. Determine the feasibility and acceptability of vaccinating adolescents in US settings complementary to the medical home.
 - a. Evaluation and research objectives should:
 - i. Include assessments of existing infrastructure, opportunity costs (e.g., for local public health), and comparative cost-effectiveness.

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- ii. Focus on the general adolescent population as well as sub-populations (e.g., racial and ethnic minorities, youth living below poverty level, incarcerated, substance using, homeless and / or pregnant youth), which may be particularly challenging to reach, educate, and vaccinate, and are therefore most vulnerable to vaccine-preventable diseases.
- b. Possible venues for future assessments may include:
 - Schools/colleges
 - Pharmacies
 - Retail locations
 - Urgent care, emergency departments, and hospitals
 - Religious, spiritual, and cultural venues
 - Mobile vans
 - Sexually Transmitted Diseases (STD) clinics
 - Offices of physicians who have not historically provided a medical home to adolescents (e.g., obstetrician/gynecologists)
 - Substance abuse clinics
 - Runaway/homeless shelters
 - Teen social venues
 - Correctional facilities
 - Family planning clinics
2. Promote and facilitate implementation of vaccination services in complementary settings shown to be appropriate and effective (based on the research conducted in #1 above). As part of the implementation, each setting should have a plan for partnering with every

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patient's medical home (e.g., using an IIS to report vaccines administered, referring teen to his primary care practitioner in the medical home for routine health care visits or other needed services). Each setting should develop and implement strategies to identify adolescents who do not have medical homes and refer those adolescents to local primary health care providers.

3. Promote and facilitate full participation in Immunization Information Systems (IIS) among all providers administering vaccinations to adolescents.
4. Promote and facilitate reporting to the Vaccine Adverse Event Reporting System (VAERS) among all providers administering vaccinations to adolescents.
5. Continue to monitor patterns of health care utilization by adolescents over time in order to:
 - a. Document evolving health care utilization patterns occurring in both medical homes and complementary settings
 - b. Assess changing patterns in vaccine administration occurring during preventive and non-preventive care visits in the medical home
 - c. Evaluate the effects changing patterns (observed in all settings) have on:
 - Overall adolescent immunization rates
 - Coverage disparities among sub-populations (which may be observed as coverage assessments improve)
 - Delivery of other health care preventive services recommended for adolescents
 - d. Identify additional venues that may be appropriate for adolescent vaccination services
 - e. Ensure limited resources used to provide vaccination services in complementary settings are being employed effectively

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6. Improve comprehensive medical care programs for adolescents in foster care, residential treatment facilities and correctional facilities, including delivery of age-appropriate immunizations consistent with ACIP recommendations.

CONSENT

As more vaccines are recommended for use in adolescents, the ability or inability of an adolescent to give consent to receive vaccines may become an issue in their utilization.

Currently, the recommended age for receiving these vaccines is 11-12 years, where health care utilization patterns involving direct parental participation make consent issues of less concern.

However, recommendations for the use of these and other vaccinations also include catch up in older adolescents who may be receiving their health care in situations where parental or guardian consent is not easily available. The right to consent to health care by minors is currently determined by state law and varies widely. All 50 states and the District of Columbia have laws related to health care consent by minors.¹⁰

1. All health care providers and their staff who may potentially provide care to adolescents should become familiar with their states law regarding a minor's right to consent to health care. If barriers relating to consent are perceived, providers are encouraged to work with their state immunization program office to develop strategies that can facilitate uptake and access to vaccines in this age group.
2. Health care providers and their staff members should ensure that current Vaccine Information Statements are provided to all persons providing legal consent for adolescents' vaccinations.

3. Adolescents should be fully informed regarding the benefits and any potential risks associated with vaccines they receive, regardless of the individual consent laws in each state. This should include information in an age appropriate format as well as the Vaccine Information Statements. Understanding the value and rationale for immunizations is important to future immunization acceptance by adolescents themselves and for their children in the future.

COMMUNICATION/PUBLIC ENGAGEMENT

Communication is an important aspect of any public health effort both to help families with their health care decisions and to help health care professionals with quality immunization delivery. The need for health communication is pronounced in the case of the adolescent immunization program because levels of knowledge of the adolescent vaccines and the diseases against which they protect are not universally high. Because the decision to provide or accept vaccinations has both technical and socio-emotional components, communication must address both levels.

Health communication at a public health level is analogous to health communication at the clinical level; it requires skill at both listening and expressing. In order to optimize public policy and public health we need to continuously improve our “listening” –for example, expanding our understanding of adolescent, family, and health care professional perspectives on adolescent immunization through consultation and participation in dialogue. Additionally, we need to continuously discover and implement best practices in conveying public health messages, for example, increasing awareness of the benefits of adolescent immunization among special target audiences (e.g., third party payers, employers, legislators, community leaders, hospital

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administrators, and educators). As with childhood immunization, the ability to rapidly and effectively communicate scientifically sound information on emerging vaccine safety issues to all stakeholders will be a public health imperative. Resources should be made available to support the quality of both the listening and expressing components of health communication regarding adolescent immunization.

Below are some principles of health communication that directly apply to adolescent immunization.

1. Quality. The adolescent immunization communication efforts should be of high quality. Pre-release testing should assess for the quality of the communication. Materials and messages should be:
 - Accurate -- scientifically correct and appropriately thorough
 - Appealing -- presented in a manner that is likely to be most appealing to the given audience
 - Relevant – addressing the concerns of the audience
 - Appropriate -- detailed below
2. Tailored messages. Messages should be carefully designed for audience needs.
 - a. Addressing needs of audience segments: If empirical research identifies that different communication modes or content work better based on audience characteristics, messages should be tailored for specific audiences. Both the media and the message should relate to the needs and concerns of respective target audiences. The needs of adolescent and family audience segments vary based on factors such as age, sex,

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language, health literacy, culture, and cognitive or developmental stage. Messages for health care professionals should be targeted for their licensure (e.g., MD, DO, PA, NP, RN, PharmD, etc.) and specialty (e.g., OB-GYN, Pediatrics, Family Practice).

- b. Reaching audiences who most need prevention: It is important to create adolescent immunization messages for the general public, but efforts also should be made to design messages to address the needs of audiences that are in greatest need of specific information. For example, special efforts should be made to get appropriate messages about human papillomavirus (HPV) prevention to groups with the highest incidence of HPV infection and the highest incidence of death from cervical cancer.

Immunization strategies based on vaccinating only high-risk groups generally have been ineffective as have been health communication strategies based on “one-size-fits-all” messages. For this reason we support the current broad vaccination recommendations communicated in ways that most precisely address the needs of specific segments of the intended audience.

- c. Preventing information overload: The information content of the messages should be layered so as to provide the needed information without overwhelming the recipient with unwanted information. Links to more detailed information can be used if there is concern that recipients may need more information later.

3. Collaboration. Organizations involved in adolescent immunization should learn from and collaborate with a broad spectrum of groups that have interest and expertise in immunization and/or communication to youth and their parents. Some examples follow.

- Federal, state, and local public health personnel and organizations – e.g., National Association of County and City Health Officials

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- Organizations for health care professionals – e.g., American Academy of Pediatrics, American Academy of Physician Assistants, Academic Pediatric Association, Society for Adolescent Medicine, Infectious Disease Society of America, National Association of Pediatric Nurse Practitioners, National Association of School Nurses
 - Health insurance plans
 - Vaccine manufacturers
 - Not-for-profit organizations – e.g., American Cancer Society, Immunization Action Coalition
 - Parent groups – e.g., National Meningitis Association, Parents of Kids with Infectious Diseases, Families Fighting Flu
 - Organizations that serve adolescents – e.g., Boys & Girls Clubs of America, Girl Scouts of America, Big Brothers, Big Sisters of America, sports organizations
 - Educational organizations, including those that develop primary and secondary educational curricula
 - Others who have developed successful public health communication campaigns such as the anti-smoking campaign
 - Advertising and media professionals – e.g., producers of movies and television programs, editors of magazines and other publications targeted at adolescents
 - Relevant computer and Internet companies – e.g., social networking website companies, publicly available personal health record
4. Research. Communication of adolescent immunization should be informed by methodologically sound research on the target population's knowledge/understanding, awareness, attitudes, and concerns about adolescent immunization.

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- a. Results of formative research should be communicated broadly (e.g., peer review publication, collaborative organization journals and websites, inclusion on a federal website)
 - b. Longitudinal surveillance mechanisms should be established in order to determine adolescent, family and health professional perspectives. This system should serve as a springboard for public health policy and programs. This is important because knowledge, attitudes and behaviors of these groups will change over time and health communication should be responsive to these changes.
 - c. Ad hoc studies on 'hot topics' should be supported in order to determine adolescent, family and health professional perspectives. This system should serve as a springboard for public health policy and programs.
5. Communication about adolescent immunizations within the clinical setting
- a. Important communication about adolescent immunization should occur within the medical home and other venues where adolescents receive care. This comes in several forms – e.g., discussion with parents during well care visits and consumer reminders in the form of telephone or mailed reminders to come in for vaccination.
 - b. Training and materials for use by primary care health care professionals should be readily available at no cost to providers, adolescents, and their parents/guardians.
 - c. Compensation for the time health care professionals spend communicating to parents and adolescents about the vaccines should be fair. The details of this are beyond the scope of these recommendations. This statement is included only to acknowledge that communication in the clinical setting takes clinician time, which should be valued and compensated.

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6. Broad dissemination. A wide range of venues and media outlets should be utilized to reach target audiences. Along with traditional advertising media, other media should be utilized. These include organizational media (e.g., newsletters), new media (e.g., email, text messages, YouTube), and non-traditional modes (e.g., product placement, developing spokespersons within the target audiences, and linkages to products designed for adolescents or their parents).

FINANCING

The financing of vaccines and related services for adolescents presents distinct challenges. Vaccines recommended for this age group are relatively expensive compared to those recommended for infants and young children. This has the potential to put significant strain on both public and private sector payers. Fewer adolescents, compared to younger children, have private health insurance coverage for preventive services. At the same time, compared with infants and young children, fewer adolescents are eligible for the federal Vaccines for Children (VFC) program.¹¹ The adolescent working group has provided information regarding such distinct challenges, and possible approaches to addressing them, to an NVAC working group addressing vaccine finance for infants through adolescence. Consolidated recommendations addressing vaccine finance challenges are in development.

SURVEILLANCE

Efforts to promote vaccine coverage for children have benefited from the ability to monitor trends in coverage and to analyze them in enough detail to initiate improvements in immunization programs. Similarly, surveillance of vaccine preventable diseases among children

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has demonstrated reductions in disease burden, morbidity, and mortality stemming from successful implementation of immunization recommendations.¹² Such data are essential to demonstrating the usefulness of immunization and identifying issues including health disparities.

Surveillance is also expected to be an essential tool for supporting, evaluating and improving immunization among adolescents. There are distinct challenges. Among the challenges in determining coverage are the use of complementary and alternative immunization venues, the lack of consistent reporting, dependence on electronic systems that do not allow integration of functions to facilitate reporting, limitations of recall-based survey methodologies, and problems in reaching representative sample populations. Tracking disease burden among adolescents is made difficult by factors including non-classical presentations (as observed with pertussis) and underreporting (e.g., genital warts). Below we make recommendations for surveillance and monitoring of three key areas: vaccine coverage, disease burden, and vaccine safety and vaccine associated adverse events. These recommendations should be considered for both existing surveillance systems and mechanisms as well as for new initiatives that may be implemented in the future.

1. Surveillance for vaccine coverage

- a. Longitudinal measurement of vaccine coverage among adolescents requires sustainable systems
- b. Surveillance systems should be sustained or developed that are able to measure coverage by:
 - i. Year
 - ii. State

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- iii. Age
 - iv. Antigen/Strain/Pathogen
 - v. Race and ethnicity group
 - vi. Health care coverage status (e.g., insured, underinsured, uninsured) and type (e.g., public, private)
 - vii. Poverty level
 - vi. Residential area (e.g., urban, suburban, rural)
 - c. Efforts should be made to measure coverage among groups at risk, including incarcerated, substance using, homeless and pregnant youth and those with chronic illnesses.
 - d. Well-defined coverage targets should be developed for vaccinations routinely recommended for administration to adolescents. National indicators are needed in the following areas:
 - i. Vaccination coverage
 - ii. Immunization Information Systems (e.g. adolescent participation rate, provider reporting rate for adolescent vaccines, etc)
 - iii. Health Plan Employer Data and Information Set (HEDIS) measures on Adolescent Immunization Status (i.e., HEDIS measures should be updated to reflect current adolescent recommendations)
2. Surveillance for disease burden
- a. Ongoing measurement of vaccine-preventable disease burdens should include reportable and non-reportable conditions. Standardized case definitions should be employed, and to the extent possible, cases should be confirmed by appropriate laboratory tests. For some

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diseases (e.g., meningococcal disease and human papillomavirus) specific surveillance to track serogroups or genotypes is needed. Both passive and active surveillance may be needed for some vaccine-preventable diseases.

- b. Impact of adolescent immunization outside of the target age group needs to be considered, especially for pertussis and human papillomavirus.
 - c. For some pathogens, including human papillomavirus and varicella-zoster viruses, both long term and short term outcomes should be measured. As an example, many years will likely be required to measure and document the impact of human papillomavirus vaccination upon the rates of cervical cancer among U.S. females; however, decreases in the occurrences of cervical cancer precursors and genital warts may be appreciable during a shorter time horizon.¹³
 - d. Surveillance should be updated to anticipate new indications and new antigens. This will allow establishment of baseline infection /disease rates and facilitate future assessments of vaccination impact [e.g., improved surveillance related to cytomegalovirus (CMV) infection may be warranted given that CMV vaccine candidate(s) are in development].
 - e. Data should be collected with sufficient detail that changes can be correlated with vaccination rates.
3. Monitoring for vaccine safety and vaccine associated adverse events
- a. Surveillance and hypothesis testing systems should include adequate numbers of adolescents to detect and evaluate safety signals.
 - b. Research should anticipate the conditions that frequently arise during adolescence that might be considered as potential adverse events. Definitions and background rates should be developed in advance for these conditions and disorders.

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4. All surveillance systems supporting adolescent immunization
 - a. These systems should reflect the qualities of any effective surveillance system: They should be timely, representative, consistent, accurate, and the results should be widely disseminated in a timely manner to influence policy and practice. The systems should adapt to and take advantage of changing technologies.
 - b. For surveillance systems to work, all health care providers delivering immunizations to adolescents in communities and other settings (e.g., military, corrections facilities, colleges) should be provided with education regarding the importance of disease reporting, adverse event reporting, and participating in immunization information systems (IIS).

SCHOOL MANDATES

Compulsory or mandated vaccinations for school entry are credited with helping the United States achieve high childhood vaccination coverage rates and subsequently low rates of vaccine-preventable diseases among young children.^{14,15} While school mandates have proven to be a valuable public health tool, they have also generated concern and debate regarding their ability to balance the public's health and individual/parental rights.¹⁶ In a previously published paper¹⁷, the NVAC adolescent working group assessed the issues related to school mandates for adolescent vaccination and provided recommendations for jurisdictions considering implementation of an adolescent vaccination mandate. In the interest of being complete, we are including the school mandate recommendations here.

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1. Partnership. Secure the input and partnership of state and local immunization program personnel and adolescent health care providers in drafting legislation/regulation regarding mandating adolescent vaccines. Work closely with school administrators and school health personnel to ensure that potential school-level administrative and enforcement burdens are minimized.
2. Infrastructure and Financing. Use the expert input of partners to address infrastructure issues that may impact the implementation of an adolescent vaccine mandate. These include such issues as: vaccine purchasing, supply, storage, safety profile, uptake, and target population. Identify and plan for all direct and indirect costs of vaccine administration, including adequate provider reimbursement and costs associated with implementing a new mandate, to ensure equitable access to mandated vaccines.
3. Consistency. Look for ways to incorporate new mandates as seamlessly as possible into existing vaccine legislation/regulation, and ensure that new mandates do not contradict existing legislation/regulation in areas such as reporting of coverage levels, penalties for non-compliance (e.g., being held out of school), and immunization information system reporting requirements. Consistency with existing policies may also minimize vaccine-specific or convenience exemptions when a new vaccine is introduced.
4. Support. Ensure that adequate political and public support exists before incorporating an adolescent vaccine mandate into existing state legislation/regulation. Education of parents and health care providers on vaccines, vaccine-preventable diseases, and mandates is encouraged to secure public understanding and support, increase voluntary uptake, and to minimize the administrative burden on school health personnel.

Conclusion

In this report we have provided recommendations to five critical issues challenging the US health care system to fully vaccinate the adolescent population. Undoubtedly, some of the recommendations will require new resources and it is our sincere hope that policy makers will recognize the importance of adolescent vaccination and provide the necessary resources. The US has a history of implementing and sustaining a strong infant and childhood immunization program and we believe the same can be achieved for the adolescent population. We strongly urge policy makers, immunization program managers, and health care providers to work together to implement these recommendations and create a strong adolescent immunization program.

The adolescents of our nation deserve no less.

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Disclaimers

Some of the authors/contributors listed in this paper are employees of the United States Department of Health and Human Services. Although they served as authors/contributors because of their significant contributions to the paper based upon their areas of expertise, the views represented in this paper are those of the National Vaccine Advisory Committee. The positions expressed and recommendations made in this paper do not necessarily represent those of the United States Government or of Departmental employees who served as authors of, or otherwise contributed to, this paper.

The National Vaccine Advisory Committee unanimously voted to endorse this paper and the recommendations herein. These recommendations have been submitted to the Assistant Secretary for Health, within the United States Department of Health and Human Services. The National Vaccine Advisory Committee serves the Department in a purely advisory capacity.

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