



# Nurse Practitioner Healthcare Foundation

*Improving Health Status and Quality of Care through Nurse Practitioner Innovations*

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## Adolescent Health: Immunizations Are Key to Prevention

*A White Paper by the Nurse Practitioner Healthcare Foundation*

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### Introduction

Adolescent immunizations are central to ensuring that patients achieve and maintain good health into and through adulthood. Therefore, immunizations are an important component of adolescent preventive care. Advances in vaccines and changes in the adolescent immunization schedule have renewed the emphasis on adolescent preventive care. Healthcare professionals are integral to ensuring that adolescents have the preventive care and the immunization protection they need. Every encounter between an adolescent and a clinician should be an opportunity to check the patient's immunization status. With a steadfast commitment to preventive care throughout adolescence, sound immunization practices, and supportive policies, healthcare professionals can move the nation closer to achieving the national *Healthy People 2010* objective of 90% vaccination coverage for adolescents by 2010.<sup>1</sup> Achieving and maintaining high immunization rates are critical for disease prevention.

### Healthy People 2010

As we approach the year 2010, we have made progress but we have not reached our *Healthy People 2010* national goals for adolescent preventive care and immunizations. The *Healthy People 2010* Objective 14-27 is to achieve 90% vaccination coverage among 13- to 15-year-olds with 3 or more doses of hepatitis B vaccine; 2 or more doses of measles–mumps–rubella (MMR) vaccine; 1 or more tetanus–diphtheria (Td) booster; and 1 or more doses of varicella vaccine (excluding children who have had the disease).<sup>1</sup> From a national perspective, we have exceeded the MMR and Td booster goals and have achieved 79% of the target goal for hepatitis B and 71% of the target goal for varicella for adolescents.<sup>1</sup> Since the 2010 objectives were developed almost 10 years ago, the recommended adolescent immunizations have been expanded substantially and now include a pertussis booster combined with the tetanus–diphtheria booster (Tdap) and a meningococcal vaccine for all adolescents. In addition, the national immunization schedule recommends that all females aged 11-12 years old receive a series of 3 human papillomavirus (HPV) vaccinations, with catch-up HPV vaccines through age 26.<sup>2</sup>

Hepatitis B vaccination in adolescents is one example of a great success story, but we still need to improve coverage rates. As more adolescents were immunized against hepatitis B, new cases of hepatitis B in 19- to 24-year-olds decreased from 18.5 per 100,000 in 1997 to 5.4 per 100,000 in 2005.<sup>1</sup> We still have an opportunity to raise adolescent hepatitis B immunization rates from 79% to 100%, which will help us reach the 2010 objective to lower the incidence of hepatitis B among 19- to 24-year-olds by two thirds, to 1.8 per 100,000, by 2010.<sup>1</sup>

## Preventive Care

In infant and preschool care, the immunization schedule has been a focal point for ongoing preventive care visits and anticipatory guidance. Adolescents, who are undergoing many physiologic and emotional changes, need the same structured focus on preventive care and immunization assessments. Most children enter adolescence making positive, health-promoting choices; however, by the last year of high school, teens are more likely to engage in risky behaviors.<sup>3</sup>

The Society of Adolescent Medicine has recommended three distinct preventive care and immunization assessment visits: at 11-12 years, at 14-15 years, and at 17-18 years.<sup>4</sup> Immunizations are a concrete service that brings patients into the office or clinic for preventive care. Immunization visits can create the momentum for increased wellness visits, more anticipatory guidance, more preventive care, and more opportunities to reinforce health-promoting behaviors.

Rand et al identified utilization patterns for adolescents by assessing outpatient and office visits using 10 years of data (1994-2003) from the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey.<sup>5</sup> The investigators discovered that one sixth to one third of adolescents do not see a healthcare professional in a given year. In addition, low-income adolescents receive less primary care than do their wealthier counterparts.<sup>6</sup> Preventive care was uncommon (only 9% of all visits) for all adolescents. However, adolescents <14 years were 3 times more likely than those >14 years to have had a preventive care visit. Primary care visits for both preventive and acute care dropped off precipitously after age 16. The adolescents received care in a variety of settings. Although younger adolescents were more likely to receive care from a pediatrics office (59% of visits for girls and 66% for boys), older adolescents were more likely to receive care from a family or internal medicine practice (50% of visits for females and 70% of visits for males). More than one third (35%) of older female adolescents receiving preventive care (not including prenatal care) sought that care from obstetric/gynecologic clinicians.<sup>5</sup>

## Immunizations

Immunizations are a proven preventive strategy for persons of all ages.<sup>7</sup> Not just for the very young or very old, immunizations prevent disease for everyone throughout the lifespan. When more persons are immunized, a “herd immunity” effect is created; because fewer persons are susceptible to the infection, fewer people can contract the infection and infect others, creating a healthier community.<sup>7</sup> The Centers for Disease Control and Prevention’s (CDC’s) Advisory Committee on Immunization Practices (ACIP), which develops the immunization schedule, recommends immunization against 17 vaccine-preventable diseases (VPDs) across the lifespan.<sup>2</sup> Adolescents may need catch-up immunizations for those missed in earlier years, as well as three adolescent-specific immunizations and additional immunizations for certain high-risk groups. Immunizations specifically recommended for adolescents include meningococcal, tetanus–pertussis, and influenza vaccines for all males and females, and the HPV vaccine for all females. The meningococcal and tetanus–pertussis vaccines should be given once in the adolescent years, and the influenza vaccine should be given every year.<sup>2</sup> Under ideal circumstances, these immunizations should be given at age 11-12 (with 3 visits for females to complete the HPV series), along with annual influenza vaccinations.<sup>2</sup>

## Immunizations for All Adolescents

Meningococcal disease is relatively uncommon, but when it strikes, the consequences can be devastating. *Neisseria meningitidis* is a leading cause of bacterial meningitis and sepsis in the United States.<sup>7</sup> The case-fatality rate (number of deaths/number of cases) of invasive meningococcal disease is 10%-14%, even with prompt and appropriate antibiotic therapy. The fatality rate of meningococcal sepsis, infection in the blood, is about 40%. Up to 20% of survivors have permanent sequelae such as hearing loss, neurologic damage, or loss of limbs.<sup>7</sup> The epidemiology of meningitis infections indicates highest prevalence among college freshman living in dormitories (5.1/100,000), with peak incidence at age 18.<sup>7</sup> The ACIP recommends that all persons aged 11-18 years be vaccinated with one dose of the meningococcal conjugate vaccine (MSV4) at the earliest opportunity.<sup>8</sup>

Pertussis, also known as whooping cough, is the only VPD with an increasing incidence trend in the past 10 years.<sup>7</sup> Adolescents are the age group with the highest incidence of pertussis.<sup>7</sup> Waning immunity from childhood, increased exposures, and improved diagnosis may all be contributors to the increased incidence. Not only are adolescents at risk of getting pertussis, but they may also be the source of infection to infants who have not completed the infant diphtheria–tetanus–acellular pertussis (DTaP) series. It is now recommended that adolescents have 1 adolescent-dose formulation of the Tdap vaccine. This vaccine provides booster protection not only against pertussis, but also against tetanus and diphtheria.

Influenza can be more than an upper respiratory infection. Every year in the United States, on average, as many as 1 in 5 persons gets the flu, more than 200,000 persons are hospitalized with flu complications, and about 36,000 persons die of the disease.<sup>7</sup> Influenza can be particularly devastating for the very young and very old; immunizing adolescents against influenza not only protects the adolescents themselves but also reduces the prevalence of infection in the community, thereby providing indirect protection to more vulnerable groups. An annual influenza vaccination is recommended for all children and adolescents aged 6 months to 18 years and to anyone who wants to avoid getting influenza.<sup>9</sup>

## Immunizations for Female Adolescents

HPV is a common infection spread through sexual contact. Current ACIP recommendations are to immunize females aged 11-12 years, with catch-up immunization given up to age 26. The HPV vaccine is not approved for use in males. Estimates suggest that as many as 64% of female adolescents are infected with HPV and that 75% of new infections occur in females aged 15-24 years.<sup>7</sup> The currently available formulation of HPV vaccine contains the HPV strains associated with the most common cervical cancers. The ACIP recommends that all girls aged 11-12 years complete the 3-dose series, with catch-up for females up to age 26. Because multiple strains of HPV exist, having a history of HPV infection is not a contraindication to the vaccine.<sup>2,7</sup>

## Other Vaccines for High-Risk Groups

Pneumonia and hepatitis A immunizations are recommended for certain high-risk groups. Individuals with risk factors must be systematically identified, without stigmatization, and immunized as recommended by the ACIP in the Child and Adolescent Immunization Schedule, issued each year by the Centers for Disease Control and Prevention (<http://www.cdc.gov/vaccine>).

## Catch-up on Missing Vaccinations

With the complex recommendations for childhood and adolescent immunizations, the wide variation of locally determined school entry requirements, and family mobility, many adolescents are likely to be missing the protection of one or more vaccines typically given in younger years, such as the complete series for hepatitis B, MMR, polio, and varicella. Healthcare professionals should review adolescents' immunization status at every visit. The early adolescent visit is a key opportunity to ensure that any vaccinations previously missed are received and to begin the adolescent vaccine series.

## Barriers and Missed Opportunities

Barriers to full immunization include lack of information or services and limited access related to cultural beliefs, language or level of health literacy, geography, time and priorities, and financial issues. Practice policies and procedures may also create barriers and missed opportunities.

Although adolescent preventive care visits are relatively uncommon, many practice barriers to immunization and preventive care are actionable. Among 6- to 17-year-olds, 86% have had an office visit, emergency department visit, or home visit by a healthcare professional in the past 12 months.<sup>10</sup> Missed opportunities occur when adolescents gain access to an aspect of care—such as a healthcare visit for a sports or camp physical, a sports-related injury, an acute illness, or family planning—and they do not receive immunizations.

## Declining Access to Preventive Care and Immunizations

Access to preventive care and immunizations declines after adolescence. In fact, adolescence may be the last stage of life during which an individual has health insurance and/or access to immunizations. Healthcare professionals should immunize adolescents while they have coverage. Although 89% of adolescents aged 11-17 years have some form of public or private insurance, 1 in 4 persons >18 years lacks insurance coverage.<sup>10</sup> Young adults aged 18-24 years are the least likely to have health insurance.<sup>11</sup> Vaccines for Children (VFC) can provide immunizations for uninsured, underinsured, and Medicaid-eligible children in some settings. However, VFC benefits ends at the 19th birthday. The future can be unpredictable for adolescents.

## Lack of Access to Immunization Coverage

Having health insurance does not guarantee payment or reimbursement for immunizations. The growing trend toward higher deductibles and co-payments creates financial barriers to immunizations for many people. Some underinsured children may qualify for free vaccines in some states, but this avenue for coverage can be spotty. The VFC program often requires that children receive the vaccine only at a federally qualified health center, which can present substantial logistical barriers.<sup>12,13</sup> Some states have used state funds to provide publically purchased vaccines for uninsured children in private offices, but 30 states, facing a growing list of recommended vaccines and a growing budget deficit, have been unable to provide publically purchased vaccines to underinsured children in private offices.<sup>12,13</sup>

## Additional Immunization Barriers

Another challenge with regard to immunizing adolescents is the need for parental consent. The logistics of having parent, adolescent, and immunizer together can be complex. Carefully planned strategies to obtain signed consents can help. Furthermore, parents and adolescents may hold misconceptions about vaccinations that can be addressed with thoughtful, straightforward discussion and provision of accurate information.

## RECOMMENDATIONS

### 1. Raise awareness of the need for adolescent immunizations among 11-to 12-year-olds and their parents.

Recommended strategies for achieving *Healthy People 2010* goals include the following: “Initiate preteen vaccination campaigns designed to reach parents of 11- to 12-year-olds and their healthcare providers to raise awareness of new vaccines available to enhance health in this age group. Encourage development of an adolescent equivalent of the well-defined, scheduled, pediatric well-child visits for young children.”<sup>11</sup> Garner parental support for early adolescent immunizations by encouraging timely immunizations and answering parents’ questions. A stronger emphasis on adolescent preventive care can increase opportunities for immunizations; likewise, immunizations can increase opportunities for preventive care. A need for immunization can serve as the “back door” to the clinician’s office; once patients walk through that door, then all other important healthcare issues can be discussed.

### 2. Communicate with adolescents in their own venues; put messages where adolescents are and make it fashionable to get immunized.

Communicate with families in multiple venues, multiple languages, and multiple literacy levels; in newsletters and text messages; on websites; at school functions; and at sporting events. School nurses/nurse practitioners can play an important role in providing information and encouraging full immunization of all students. Consider communicating with adolescents through social network websites (eg, Facebook, MySpace) and on their cell phones. Adolescents can program their follow-up immunizations into their cell phones right in your office. Have adolescents use peer-to-peer language and communication styles to encourage immunizations. Create an environment that values adolescent immunizations and makes it fashionable to be immunized.

### 3. Remove financial barriers.

Remove high co-payments and deductibles for immunizations. Immunizations benefit not only the individual’s health but also the community’s health. All health insurance plans, regardless of the source of funding, should cover all ACIP-recommended vaccinations without an out-of-pocket expense. Healthcare professionals should participate in VFC and ensure that eligible patients receive the program’s benefits.

### 4. Leverage health plans to encourage adolescent immunizations.

Health plans should aggressively encourage adolescent immunizations through coverage, member communications, payment structures, and quality improvement initiatives. Health plans can provide proactive communication through member education with targeted messages to adolescents and their families. Health plans’ coverage structures can facilitate preventive care and immunizations by removing deductibles and co-payments for preventive care.

Immunization rates can improve with the use of health plan quality indicators, such as the Healthcare Effectiveness Data and Information Set (HEDIS). HEDIS is used by >90% of US health plans to measure performance on important dimensions of care and service. HEDIS measures are also linked to health plan accreditation and are used by purchasers to compare health plans’ quality. For several years, HEDIS measures included some adolescent immunization measures (hepatitis B, MMR, Td), but the 2008 HEDIS retires these measures. The 2009 HEDIS may have new adolescent immunization measures. The National Committee for Quality Assurance State of Healthcare Quality report,<sup>14</sup> which compiled HEDIS results from 767 health plans, showed that 57.7% of adolescents in commercial plans and 51.2% in Medicaid health plans had completed a combination of varicella, hepatitis B series, and MMR immunizations. These proportions are a significant increase from 18.4% for commercial plans and 13.2% for Medicaid health plans in 2000. Although some of this improvement may simply reflect better data collection, it also shows that what gets measured gets done. Updated adolescent HEDIS measures in the 2009 and subsequent HEDIS criteria may stimulate more immunizations for adolescents in health plans.

### 5. Encourage local, state, and national registries to include adolescent data.

Registries are in various stages of implementation in cities and states across the nation. Most registries are focused on infant and preschool immunizations. Adolescent immunization registries, especially given the mobility of this patient population and the variety of locations for care, may facilitate improved immunization coverage.

## **6. Support multiple venues for immunization education and for administration of immunizations.**

Public health agencies and health-related professional organizations should promote adolescent immunizations by collaborating with multiple immunization venues. All children, adolescents, and adults benefit from having a healthcare home. However, with good communication, other venues can encourage and provide immunizations. Retail settings, sports physical appointments, health fairs, and school health offices are some venues for immunizing. Electronic record transfer to healthcare homes and connectivity with robust registries can facilitate such linkages. Consider creative venues for immunizing adolescents, such as school functions, ball games, and other places frequented by adolescents. Engage the foreign language media in encouraging immunizations and communicating the need for adolescent vaccines.

## **7. Every healthcare professional needs to be current on immunizations.**

Clinicians need to use the most current schedules (issued each year in December for the forthcoming year at [www.cdc.gov/vaccines](http://www.cdc.gov/vaccines)) so that they are clear about what is needed. Major continuing education venues and professional association conferences can help practitioners keep up to date by including sessions on current immunization recommendations and practices.

## **8. Eliminate practice barriers to immunizations.**

- Implement diverse strategies to improve series completion. Visits to complete immunizations may require ongoing vigilance and creative strategies to encourage return visits. Establish easy access for follow-up immunizations with walk-in immunizations and standing orders. Develop inventive reminder systems that are tuned in to adolescents, such as text messages, instant messages, and social networking websites, for return visits. Keep the office or clinic open during evening hours to facilitate access for adolescents. These strategies follow the standards for adolescent immunizations established by the National Vaccine Advisory Committee.<sup>15</sup> Develop innovative ways to obtain parental consent and still vaccinate adolescents in places convenient for them.
- Implement quality indicators and incentives for healthcare professionals to provide preventive care and adolescent immunizations. Immunizations are easy to track and measure, and can show positive progress. Clinicians can measure progress toward improving adolescent immunizations in their practices with electronic records or the CDC's Clinical Assessment Software Application software (CASA, available free of charge at <http://www.cdc.gov/vaccines/programs/cocasa/default.htm>). *Healthy People 2010* objectives include increasing the proportion of clinicians who have full recommended vaccination coverage levels among children in their practice population measured within the past 2 years to 55%. Although this objective focuses on practitioners caring for infant and preschool populations, it is applicable to all clinicians serving adolescents.<sup>1</sup>

## **Summary**

Adolescent immunizations merit increased effort to ensure adequate protection. The adolescent immunization schedule calls for multiple vaccinations, ideally given around age 11-12 years, with annual influenza immunizations. Proactive strategies and preventive care can raise adolescent immunization coverage and protection. Recommendations include:

1. Raise awareness of the need for adolescent immunizations among 11- to 12-year-olds and their parents.
2. Communicate with adolescents in their own venues and ensure that messages are visible.
3. Remove financial barriers.
4. Leverage health plans to encourage adolescent immunizations.
5. Encourage local, state, and national registries to include adolescent data.
6. Support multiple venues for immunization education and administration.
7. Healthcare professionals should keep current on immunization information; make sure that colleagues are up to date as well.
8. Eliminate practice barriers to immunizations.

With concerted effort to immunize adolescents, we can ensure that these youngsters are protected against VPDs. Our success with infant and preschool immunizations can serve as a model for what we can achieve for adolescent immunizations.



## References

1. US Department of Health and Human Services, Office of Health Promotion and Disease Prevention. Healthy People 2010 Midcourse Review. 2006. Available at: [www.healthypeople.gov/Data/midcourse/](http://www.healthypeople.gov/Data/midcourse/)
2. Centers for Disease Control and Prevention. 2008 Child & Adolescent Immunization Schedules. 2008. Available at: <http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm#mmwr/>
3. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance—United States, 2007. *MMWR*. 2008;57(SS-4):1-131. Available at: <http://www.cdc.gov/HealthyYouth/yrbs/index.htm>
4. Middleman A, Rosenthal S, Rickert V, et al. Adolescent immunizations: a position paper of the Society of Adolescent Medicine. *J Adolesc Health*. 2006;38:321-327.
5. Rand C, Shone L, Albertin C, et al. National health care visit patterns of adolescents; implications for delivery of new adolescent vaccines. *Arch Pediatr Adolesc Med*. 2007;161:252-259.
6. Newacheck PW, Hung YY, Park MJ, et al. Disparities in adolescent health and health care: does socioeconomic status matter? *Health Serv Res*. 2003;38(5):1235-1252.
7. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Pink Book. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 10th ed, 2nd printing. Washington, DC: Public Health Foundation; 2008.
8. Centers for Disease Control and Prevention. Revised recommendations of the Advisory Committee on Immunization Practices to vaccinate all persons aged 11-18 years with meningococcal conjugate vaccine. *MMWR*. 2007;56(31):794-795.
9. Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2008;57(RR07):1-60.
10. National Center of Health Statistics. *Health, United States, 2007, with Chartbook on Trends in the Health of Americans*. 2008. 567 pp. PHS 2007-1232. GPO stock number, 017-022-01604-4.
11. Rhoades JA. The long-term uninsured in America, 1999 to 2000: estimates for the U.S. population under age 65. Agency for Healthcare Research and Quality. *Medical Expenditures Panel Survey*. August 2004. Available at: [http://www.meps.ahrq.gov/mep-web//data\\_files/publications/st52/stat52.pdf](http://www.meps.ahrq.gov/mep-web//data_files/publications/st52/stat52.pdf)
12. Lee GM, Santoli JM, Hannan C, et al. Gaps in vaccine financing for underinsured children in the United States. *JAMA*. 2007;298(6):638-643.
13. Davis M. Reasons and remedies for underinsurance for child and adolescent vaccines. *JAMA*. 2007;298(6):680-682.
14. National Committee for Quality Assurance. State of Health Care Quality. 2007. Available at: <http://www.ncqa.org/tabid/543/Default.aspx>
15. National Vaccine Advisory Committee. Standards for child and adolescent immunization practices. *Pediatrics*, 2003;112:958-963.

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