Introduction: Strengthening the Delivery of New Vaccines for Adolescents

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Before 2005, vaccination of adolescents typically focused on catching up with vaccines that they had not received by school age, most commonly, the second dose of the measles-mumps-rubella vaccine, the complete hepatitis B vaccine series, and a dose of varicella vaccine if needed. With the exception of the booster dose of tetanus and diphtheria toxoids (Td), recommended for administration at a health care visit at ages 11 to 12, adolescence was not considered a primary opportunity to deliver routinely recommended vaccines. The recommendation to administer Td at ages 11 to 12 was a prominent component of the 1996 joint recommendations for adolescent immunization by the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices, the American Academy of Pediatrics, the American Academy of Family Physicians, and the American Medical Association. The 1996 recommendations were intended, in part, to provide a rationale for a health care visit at ages 11 to 12, and this idea has evolved into the “adolescent vaccination platform,” in which, similar to the childhood platform, immunizations draw parents and their children to routine preventive care visits at which other preventive care services can be delivered.

Nevertheless, although results vary, surveys of adolescents have found that many report not making a preventive health care visit in the last year. Moreover, according to a national survey of vaccination records in the home in 1997–2003, coverage with Td at ages 11 to 12 did not exceed 16% for any birth cohort studied. Coverage by ages 13 to 15 ranged from 29% to 35% over the study years (Centers for Disease Control and Prevention, unpublished data, 2005).

Beginning in 2005, 3 new vaccines that were licensed and recommended for adolescents renewed attention to the benefits of and barriers to an adolescent vaccination platform. In May 2005, recommendations were published for the administration of the first meningococcal conjugate vaccine to adolescents at 11 to 12 years of age during their preventive health care visit, to students before high school entry, and to college freshmen who live in dormitories. In March 2006, recommendations were published for the administration of the new tetanus toxoids, reduced diphtheria toxoids, and acellular pertussis vaccine (Tdap), for which adolescents aged 11 to 12 are a primary target group. Most recently, in March 2007, recommendations for administration of the human papillomavirus vaccine were published, and again, 11- to 12-year-olds are the primary target group for this vaccine. With more vaccines targeted specifically toward 11- to 12-year-olds, the case for using vaccination to create an adolescent platform is now more compelling.

Making the best possible use of these vaccines to protect adolescents from vaccine-preventable diseases and to offer other clinical preventive care is an important prevention opportunity, the planning for which reveals the need to identify:

- approaches that would most effectively and efficiently increase the proportion of adolescents who receive newly recommended vaccines; and
- ways to integrate these approaches with other adolescent health, education, and development programs.

To address these goals, the National Vaccine Advisory Committee convened a meeting that was cosponsored by the National Vaccine Program Office and the Centers for Disease Control and Prevention. Participants in the meeting, which was held on June 2 and 3, 2005, included a variety of stakeholders with an interest in adolescent immunization: private-sector providers, representatives of vaccine manufacturers. The first part of the meeting was to prepare participants to discuss 4 overarching questions:
1. Goals and Evaluation: What should be the goals of a program to deliver adolescent immunizations, and how will we evaluate the program?
2. Delivery: What approaches will most effectively and efficiently increase the proportion of adolescents who receive newly recommended vaccines?
3. Financing: How will the public and private sectors pay for vaccination?
4. Demand: How should we communicate to motivate, enhance demand, and increase acceptance among adolescents, parents, and providers?

Before the meeting, multidisciplinary teams were formed to review the literature and summarize what was known in the topic areas highlighted below; the aim was to present this information to prepare meeting participants to discuss the overarching questions.

- Delivering vaccines to adolescents in the medical home and other complementary settings, including schools
- Delivering vaccines to youth who are at high risk of being underserved by the health care system
- Impact of the newly available vaccines on clinical preventive care
- Use of state-based mandates for adolescent vaccination
- Economic analyses and vaccine financing
- Communication opportunities and challenges

Meeting participants first heard the background presentations and then met in small groups with presenters and team members for additional discussion and to provide their insights into the topic areas. The articles in this supplement result from extensive revision of most of the topic-area presentations, with input from meeting participants and others.

ARTICLES IN THIS SUPPLEMENT

In this issue, Fishbein et al summarize the etiology, pathogenesis, clinical manifestations, and epidemiology of the diseases that are newly preventable by vaccines for adolescents and describe the key features of each of the recently recommended vaccines. An overview of the vaccines previously recommended for all adolescents is included also.

The complementary articles by Szilagyi et al and Broder et al address questions about the readiness of adolescents’ medical homes to deliver these vaccines and the possible effects on the delivery of other preventive health care services. Broder et al point out that the new vaccines will almost certainly result in more health care visits by adolescents, which holds promise for improving preventive health care but also the potential for negatively impacting the time available to provide other services. Szilagyi et al point out that success will rely on overcoming barriers at the adolescent/family, health care provider, and health care system levels. Sample strategies at the practice level include using performance-improvement strategies to optimize vaccine delivery and placing an emphasis on linkages to other sites that may deliver vaccines to adolescents to effectively transfer vaccination information and make sure that comprehensive preventive care remains accessible and used.

Another pair of articles, by Schaffer et al and Lindley et al, address the potential to vaccinate adolescents outside the medical home. Schaffer et al consider pharmacies, obstetrics/gynecology practices, sexually transmitted disease clinics, hospital emergency departments, family planning clinics, teen clinics, and community health department immunization clinics and concluded that all of them could safely provide vaccinations for adolescents. Necessary for success, they concluded, will be supportive health policy, health education, and communication. Lindley et al considered vaccination in schools. The working group for this article, which consisted of a diverse group of public health and education professionals, concluded that schools may provide a range of services, from education to delivery of vaccine. However, their article strongly encourages advocates of adolescent vaccination to understand the complexities of the school setting, the primacy of the educational mandate, and the need to work collaboratively with education partners from the local level to the national level to identify and implement mutually beneficial programs.

The remaining articles remind us of other important issues. Sneller et al examine lessons learned for delivering vaccine to youth in high-risk settings, such as those who are homeless or incarcerated. Foremost among the lessons is that close collaboration among state and federal programs, local health departments, and community-based organizations has been necessary for introducing and sustaining the delivery of vaccines to youth in such settings. Ortega-Sanchez et al tackle the difficult topic of vaccine economic analyses and drive home 2 points. First, many new adolescent vaccines are more expensive than most previous vaccines; thus, policy makers and consumers must grapple with cost. In particular, policy makers must recognize the sea change in vaccine economics: a vaccine may not be cost-saving overall but may, nevertheless, provide a good value for public health. Second, the authors teach us that state-of-the-art economic analysis of vaccination must continue to improve to form a stronger foundation for decision-making about the allocation of health care dollars across the spectrum of preventive care.

Horlick et al review the basis for vaccine school-entry requirements, a topic that will remain timely as new vaccines are introduced and legislators, the public, and public health professionals weigh the potential benefits and disadvantages of using this approach to attain high rates of vaccine administration. Finally, English et al summarize the current status of consent laws; appropriately addressing consent issues both philosophically and logistically will, of course, be a key to success in vaccinating adolescents in settings in which they will not be accompanied by a parent or guardian.
OVERARCHING QUESTIONS
Informed by the background topic presentations and discussions of the topics, the meeting participants next met in 4 groups (1 for each of the overarching questions) and subsequently presented their top insights and concerns in a plenary session to conclude the meeting. The discussions of the overarching questions also guided the preparation of the articles in this supplement.

Despite the foundation laid by the background papers, meeting participants had difficulties in reaching consensus around the answers to the overarching questions they were asked to address. The outcomes of the discussions of the overarching questions suggested that although issues had been elucidated, solutions to problems had not. These discussions did raise important questions both for research and public consideration. In combination with the articles in this issue, they serve as guides for future research and discussion.

Goals and Evaluation
Meeting participants concluded that an adolescent immunization program should have 3 goals:

● reduce or eliminate morbidity and mortality that result from vaccine-preventable diseases through the use of safe and effective vaccines;
● maximize vaccination coverage through universal access, without disparities among subgroups in the population; and
● use adolescent immunization to enhance the delivery of comprehensive, integrated health care and health promotion services to improve the health and well-being of adolescents.

The meeting participants suggested that the adolescent immunization program be evaluated by national and sentinel surveillance systems that monitor vaccine safety, effectiveness, and disease incidence/prevalence and that the goal of comprehensive, integrated adolescent health care be evaluated by assessing the proportion of adolescents who have a preventive health care visit and the proportion who receive vaccination in conjunction with such visits.

Delivery
Three themes emerged:

● Adolescent vaccine advocates should consider “bringing the vaccines to where the kids are,” including the medical home and other capable settings.
● Local public health departments should coordinate and conduct needs assessments to inform and implement strategies for vaccine delivery and evaluation.
● Outcomes must be measurable and evaluated.

Discussion of delivering adolescent vaccines centered largely on exploration of current venues (such as the medical home) and potential complementary venues (such as pharmacies and schools) and integration of vaccination into existing programs and services for marginalized youth and other hard-to-reach populations. These ideas are fleshed out in the articles on the medical home, schools, complementary settings, and youth in high-risk settings in this issue.

Financing
The group that tackled the difficult question of financing identified each of the major stakeholders who might contribute solutions to the rising costs of vaccination:

● patients and their parents, who drive demand for vaccine and the type of benefits offered by insurers;
● providers and provider associations, some of whom may never have been called on to deliver vaccines and some of whom may be called on for the first time to accept delivery in nontraditional settings (providers have expressed concerns about the costs incurred in stocking vaccines);
● insurers and employers, who may be called on to respond to new demands for enhanced benefits from customers and employees;
● government, which must realize the changes in the vaccine enterprise and respond accordingly;
● industry, which is already adopting proven and new approaches for vaccines, such as direct-to-provider communication, direct-to-consumer advertising, and programs to provide free or reduced-cost vaccines; and
● nongovernment organizations, which are important partners that can help to frame and facilitate public debate and decision-making.

Among the most important insights of the group was that partnerships among the stakeholders would be necessary: concerted, coordinated effort is needed by members of each of these groups to realistically address problems such as high vaccine cost and potential disparities in coverage. Some partners will be ideally suited to explore changes in insurance practices such as reimbursement of providers for vaccine costs or first-dollar coverage of preventive care services, whereas others will be well positioned to address issues of federal and state financing, including adequate reimbursement for all costs associated with vaccine administration, which will, among other benefits, help to ensure that the medical home can remain an important source for vaccine delivery.

Demand
Information drives demand. In addition to sharing pragmatic communication strategies from their professional experiences, participants who discussed the issue of ensuring demand urged more research into the best ways to communicate to providers, the public, parents, and adolescents to drive demand for new vaccines. They noted that although some messages and strategies may be the same for all vaccines, for others, tailored messages and strategies will be needed. Participants in this discussion group also pointed out other critical gaps such as opportunities to improve practice management and financing. An especially important need that cuts across financing and communication is the critical need to reach adolescents before
they become too old to benefit from financial supports, including both public and private insurance.

CONCLUSIONS
Meeting participants expressed excitement about the adolescent platform and the potential to use it to do for adolescent health care what the childhood immunization schedule does for young children, that is, to create an expected schedule of routine contact with health care providers, during which other beneficial services can be delivered. We hope that this supplement prompts research and discussion that will help protect the nation’s adolescents against a growing number of vaccine-preventable diseases and, in so doing, draw attention and action to addressing other aspects of preventive care at this important life stage.

ACKNOWLEDGMENT
This supplement is dedicated to our dear colleague Donna Rickert. May we press on in our work to protect the health of adolescents with the intelligence, commitment, and loving kindness that were her essence.

REFERENCES
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