Discussion Paper

Immunization Financing: Where is the Breaking Point?

Task Force on Immunization

This discussion paper contains recommendations to ensure that US residents have more timely access to newly licensed and recommended vaccines by encouraging more appropriate payment to providers. This discussion paper frames goals for providers in conversations with other key stakeholders in vaccine financing.

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This document was developed by the AAP Task Force on Immunization as a basis for discussion. It does not represent official AAP policy.
AMERICAN ACADEMY OF PEDIATRICS
Task Force on Immunization

Immunization Financing: Where is the Breaking Point?

02-28-07

Introduction

Between 1989 and 1991, the United States experienced a measles epidemic. More than 55,000 people were infected, and 123 people died of measles or its complications. An assessment of the failure of the immunization program in the United States to prevent this epidemic revealed a series of barriers affecting the performance of pediatricians and other health care providers in the public and private sectors who provide immunization services. One key component in improving immunization rates is to locate these services in the medical home—where the child, parent, and provider have an ongoing relationship and shared responsibility to ensure excellent health care.

Immunization is fundamentally a public health function in which the vast majority of the population must be immunized to prevent the spread of disease. This public health function has been delegated, in many cases, to the private sector through primary care settings. In fact, the evidence is strong that children achieve higher immunization rates when private-sector medical homes participate fully, in concert with a variety of government-funded clinics, in the effort to ensure that all children receive all vaccines recommended by the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention as efficiently as possible.

The Vaccines for Children (VFC) program, established in 1993, addressed a different barrier—the cost of the immunization products. The VFC program provides federal funding to purchase vaccine products recommended by the ACIP that are administered to many low-income children. The vaccines are distributed and administered through public as well as private health care settings.

Vaccines are among the most cost-effective and life-saving interventions of modern medicine, saving the country approximately $10 billion in direct costs and $43 billion in societal costs annually. For each birth cohort of children immunized, 14 million cases of vaccine-preventable diseases are prevented, and 33,000 vaccine-preventable disease-related deaths are averted.

Although pediatricians and other primary care providers have almost universally embraced immunization as a core competency of pediatrics, recently the pressures of a rapidly increasing number of vaccines and tight financing are making primary care providers question their ability to continue to offer immunization services. The number of vaccines recommended for routine use in children has doubled over the last 15 years. The demands on primary care practices to deliver the current standards of immunization practice have increased substantially as a result.
The product-related costs of vaccine acquisition and overhead and the service costs of actively immunizing a child are fast becoming prohibitive. Primary care providers are torn between their desire to immunize and, thus, prevent disease and their need to keep their office doors open by managing a smart business. The current immunization system in the United States, which is a joint venture between public health agencies and the private sector, is “broken.”

**Background**

To provide timely and appropriate vaccines to patients, providers must acquire, store, and administer the vaccines and must receive adequate payment for vaccine-related services. National advisory committees establish standards for which immunizations should be universally recommended and when the immunizations should be given. 

Vaccines are most efficiently delivered in the primary care setting, also referred to as the medical home. Currently, between 60% and 85% of children are receiving all “older” nationally recommended vaccines from providers supervising their care, and childhood immunization rates are at their highest in history for these older vaccines. Immunization rates for “newer” vaccines (meningococcal conjugate vaccine [MCV4], adolescent tetanus-diphtheria-acellular pertussis [Tdap], rotavirus, and human papillomavirus [HPV]) are extremely low because of vaccine supply and financing problems.

Concerns about the business costs of providing immunizations are not new. More than a decade ago, immunization-related activity in the office setting became more complex and labor intensive, and health care providers began to assess whether they could afford to continue immunizing their patients. In the early 1990s, in response to pediatricians’ concerns, the American Academy of Pediatrics (AAP) conducted a national survey to establish benchmarks for the fees that pediatricians charged to non-Medicaid patients for vaccine administration. 

Similar benchmarks were established by the Health Care Financing Administration (HCFA; now the Centers for Medicare and Medicaid Services [CMS]), which used the AAP benchmarks to set maximum vaccine administration fees that states could pay providers to give vaccines to Medicaid-eligible children. Under Medicaid rules, states set their own administration fee rates, which may not exceed that maximum. By 2005, only 5 states had adopted vaccine administration fees that met the maximum HCFA/CMS fees set in 1994, with no adjustment for inflation.

A number of factors make it increasingly difficult for providers to continue participating in the current immunization program:

- Inadequate reimbursement to cover vaccine-related costs (acquisition, overhead, and administration);
- An increasing number of new and expensive vaccines; and
- A significant lag time from when a new vaccine is recommended and when health insurance plans will pay for the vaccine.

Paradoxically, new combination vaccines have not proved to be the answer to the immunization dilemma. Although evidence shows that using combination vaccines results in higher rates of
on-time immunization, primary care practices lose revenue on these combination vaccines that require the same amount of patient/parent counseling, creating significant financial disincentives for their use under current payment practices.

**From the Point of Purchase to Point of the Needle: How Immunizations Flow**

The seemingly simple process of getting a shot actually takes a surprising number of steps. The work involved between the time a primary care practice makes the decision to provide a recommended immunization and the point of administrating and getting paid for the immunization includes not only creating office policy but ordering, storing, and monitoring stability of these perishable products; insurance on the tens of thousands of dollars of sunk costs in inventory; training ancillary personnel; and educating and informing parents about the importance of immunization. The back end of the process includes billing and booking payments that occur weeks to months after the fact for most immunization work.

**Product Acquisition and Overhead**

Health care providers usually obtain vaccines for patients in 1 of 3 ways: ordering direct from a manufacturer or wholesaler; obtaining vaccines through the VFC program; or ordering vaccines from state government, especially in “universal purchase” states. The first category requires a cash investment by the provider for the product—the acquisition cost. The latter 2 do not require the cash investment. All 3 methods incur practice overhead, including:

- The cost of time spent ordering and maintaining inventory records;
- Inventory management;
- Special refrigerators/freezers, including back-up generators;
- Insurance;
- Unavoidable wastage in multidose vials or when a parent declines immunizations after the dose has been drawn up; and
- The cost of vaccines that are administered but for which payment is not received.

**Vaccine Administration**

Various combinations of vaccines are recommended at age-appropriate intervals. The schedule, which has become increasingly complex in recent years, is included as Appendix A. Before giving any vaccine, the health care provider must discuss the reasons for immunization and address any concerns raised by the parent. Record keeping around vaccines includes consent, product lot numbers, and immunization registry entries. Because these activities are separate from product acquisition and overhead, they have been assigned separate Current Procedural Terminology (CPT) codes under the category of administration fees.

The vaccine administration fee, fully detailed in Appendix B, covers the personnel time and supplies necessary to administer the vaccine to the patient, including:

- Time to obtain informed consent;
- Time spent on record keeping, including entering data in the state’s immunization registry;
- Needles and syringes approved by the Occupational Safety and Health Administration;

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• Alcohol;
• Nonsterile gloves;
• Adhesive bandages; and
• Examination table and examination table paper.

Decreasing the number of injections required through the use of combination vaccines—protecting against several diseases that used to require separate injections—does not proportionally reduce the work for health care providers. With combination vaccines, the patient/family must still give separate informed consent for each component vaccine, and information is still entered separately for each component into the immunization registry.

**Paying for Immunization: Who Pays for the Vaccine?**

As with most medical products and services, primary care providers must fund the up-front costs of immunization and recoup payment after the fact. The increasing costs over the last 2 decades are detailed in Fig 1. On the positive side, immunizations are one of the few health care services that are covered to some degree for most children, through either private or public payers. The mechanics of immunization payment vary widely by payer.

Medical billing and payment are accomplished through the use of CPT codes, which breaks out health care tasks and assigns a number to each. CPT codes exist for both vaccine acquisition and for vaccine administration. In the past, health insurance plans have reimbursed vaccine acquisition costs based on the average wholesale price (AWP), which is usually determined by the list price of the vaccine plus 20% to 25% to cover other costs incurred by vaccine providers. More recently, insurers have turned to the lower average sales price (ASP) to benchmark payments.

**Private Insurance**
Most private health insurance plans cover immunizations. Providers are paid based on their contractual agreements with various health insurance plans. Current medical billing practices divide vaccine-related service reimbursement into payment for the vaccine product and payment for vaccine administration. Vaccine-related overhead is not specifically included in either category.

**VFC Program**
Under the VFC program, the federal government gives states funds to purchase vaccines. The states then distribute the vaccines to participating providers free of charge. There is no payment to participating providers for their vaccine-related overhead.

**Universal Purchase**
Sixteen states have taken on the function of purchasing and distributing some or all ACIP-recommended vaccines for all children in the state. Providers who participate in universal purchase programs receive vaccine products free of charge from the state. The states do not reimburse participating providers for vaccine-related overhead.

**Paying for Immunization: Payment for Giving the Vaccine**
As discussed already, paying for the process of immunization is divided, by convention, into 2 categories. The first is payment for the product—the vaccine itself; the second is payment for administering the vaccine to the patient. Payment for vaccine administration varies by payer. For an office, the ability to cover costs of vaccine administration depends on the mix of the various health insurance plans, Medicaid payers, and self-pay clients served. Offices may collect 4 different levels of payment for performing the same service for 4 different payers.

**Payment for Administration**
Most public and private payers do not cover the time and supplies needed to administer vaccines according to federal and state regulations. Within the private insurance sector, most health insurance plans pay vaccine administration fees that are similar to those paid by state Medicaid programs. Both of these are significantly lower than Medicare vaccine administration fees of $18.70 for a first injection and $10.70 for each additional injection and significantly lower than the maximum allowable VFC administration fees. In states with universal purchase programs, administration fees may be billed to the health insurance plans of privately insured patients, but health insurance plans often try to limit vaccine administration fees to rates paid by Medicaid.

People paying out of pocket, including those without insurance coverage for vaccines or immunization services, are charged for vaccine administration. In addition, when parents of VFC-eligible non-Medicaid–covered children claim financial hardship, providers must administer the vaccines but are not allowed to charge administration fees.

Vaccine administration fees for Medicaid patients vary widely by state, as shown in Fig 2. Most states pay administration fees far below the maximum allowed by Medicaid, which was established in 1994.

Combination vaccines are adding an additional pressure on the system. Combination vaccines have the advantage of convenience for both the office and the family. Immunization combinations that previously required several injections are now available in a single vial. But payment for these combination vaccines, based on the number of injections, does not reflect the actual workload. Resources are still required to discuss and obtain consent for each antigen with the parent. Current CPT codes lack sufficient variation to accommodate multiple-antigen combination vaccine use or future vaccine development scenarios, like a “supershoot.”

As a consequence, providers of immunization services may avoid giving combination vaccines in an effort to maximize administration fee collections. In practical terms, an office that is reimbursed $5 to $10 per administration would lose $10 to $20 in revenue by changing from giving 3 separate injections during a visit to a single combination vaccine containing the equivalent number of antigens. Multiplying this by even 1000 vaccine visits in a year translates to a loss of between $10,000 and $20,000 in revenue.
Provisions in Health Care Contracts Regarding Vaccines Are Often Unfair to Providers

In recent years, a growing number of new vaccines have become available. When these vaccines are recommended by the ACIP and made available through the VFC program, both the patients/parents and providers feel that they become the standard of care. Often, health insurance plans do not reimburse providers for their vaccine-related costs (acquisition, overhead, and administration) when new vaccines first become available and before providers can renegotiate their contracts. This can create significant economic strain on private-sector providers if health plans expect providers to absorb the vaccine-related costs of new vaccines, as shown in Table 1.

- Health coverage contract language is generally quite broad, stating that it is the provider’s responsibility to provide all recommended vaccines to eligible covered patients based on payment arrangements agreed to when the contracts were signed. There is usually no provision allowing for contract changes to cover new vaccines or when price increases occur. Most small and medium-sized private practices do not have negotiating power to require such a provision.
- There is a lag between the time the ACIP approves a new vaccine and the time that the insurer includes payment data in computer billing systems. Patients who are aware of the new vaccine may request immunization during this interval. Under standard contract language, providers may not charge the patient for the vaccine, but will also not receive payment from the insurance company.
- When the patients’ health insurance plans do not cover the costs of newly recommended vaccines or when manufacturers raise the prices of vaccines, private-sector providers are usually prohibited from “balance billing” patients for their unreimbursed vaccine-related costs (acquisition and administration).

The AAP Task Force on Immunization Stance

There must be consensus among national provider organizations representing providers, nurses, public health, and the government and insurers that the provision of immunization services in the private sector must follow the principles of good business practices. This means that providers should have a reasonable rate of return for their expenditure of time, energy, and capital. Allowances must be made for vaccine-related overhead in addition to the cost of the product itself. Administration fee reform is essential to maintaining the medical home as a center for immunization activity. It will not do any good for providers to refer their patients to public health departments, because health departments do not have sufficient vaccine supplies, personnel, or resources to immunize all US residents.

Large outlays of capital for vaccine inventory and inadequate payment for vaccine related services are creating an emerging crisis. To achieve the goal of providing access to all ACIP-recommended vaccines for all US children, these cost pressures must be addressed.

Ensuring the Efficient Immunization of All US Residents

Given that (1) immunization is an important public good that is most successful when virtually all of a target population is immunized, (2) no public system is currently able to deliver this
public good, and (3) federal and state governments have substantial interest in ensuring high rates of immunization in the population, federal and state governments must work with vaccine manufacturers, private health insurance plans, businesses, and providers to ensure that the entire US population receive all ACIP-recommended vaccines.

Federal and state governments are major purchasers of health coverage, through Medicaid, Medicare, and other health programs. As purchasers of care, government must ensure adequate payments for vaccine and vaccine-related costs. These actions must solve problems in every state. Otherwise, some states may become reservoirs for disseminating infectious diseases throughout the nation.

The government purchases vaccine products for most low-income children through the VFC program, and provides it to health care providers free-of-charge. State Medicaid programs pay VFC vaccine providers to administer the vaccine. However, there is marked variability in state Medicaid programs’ payment for this service. Medicaid payments for vaccine administration range from a low of $2 to a regionally-allowable maximum of $18. Based on economic studies on vaccine administration, Medicare pays, on average, $21 for administration of influenza vaccine. This Medicare level must become the basis for immediate adjustments to Medicaid administrative fee payments, with future payment levels based on economic studies of the cost of pediatric immunization delivery.

Employers are also major purchasers of health coverage. Employers must encourage high immunization rates through the use of financial incentives from insurers, managed care organizations, and government, because such incentives have proven to be an effective tool to encourage providers to achieve high-quality service. In addition, employers benefit from a well-immunized workforce. When purchasing health insurance, employers must ensure that third-party payers and managed care organizations pay providers for the full cost of immunizations covered under these plans.

**Actions**

In February 2007, the AAP, in conjunction with the American Medical Association (AMA), convened the first National Immunization Congress. The Congress, representing a broad cross-section of stakeholder groups, was convened to address two goals:

- To provide access to all ACIP-recommended vaccines for the entire US population.
- To identify and prioritize key problems in the immunization delivery system and begin to find solutions.

The sessions focusing on pediatric immunization identified several key recommendations with broad consensus among stakeholders. Congress attendees agreed that the recent addition of new vaccines to an already busy immunization schedule has created an emerging crisis. This crisis threatens to greatly reduce or eliminate the role of the private sector medical home as a key provider of immunizations, and also destabilizes the public sector immunization role. The end result could be reemergence of vaccine-preventable disease outbreaks and, in the case of new vaccines, continued illness and death from diseases that could be prevented.
Several approaches were identified that could reduce or solve the immunization crisis. This multi-pronged approach, which gained the approval of a broad group of stakeholders, includes both short- and long-term solutions. The solutions focus on vaccine financing – the primary strain in the current system. These solutions include:

- The AAP and the American Academy of Family Physicians (AAFP) must obtain from CMS the economic study data supporting the Medicare influenza vaccine administration fee. This data can be used immediately to advocate with state Medicaid programs for increased administration fees to the maximum allowable under CMS rules.
- The AAP must rapidly develop concrete data on the practice costs of vaccine administration and overhead. This data should be collected and analyzed by a neutral organization with methods accepted by payers and business groups, such as that used to develop the Medicare immunization administration fees, and must also include information on the work involved in delivering combination vaccines. AAP and AAFP must use this data to advocate with health insurance plans and with CMS for payment rates that accurately reflect vaccine-related costs. In addition, this data will be used to advocate for contracts that reflect vaccine price increases and the introduction of new vaccines.
- The AAP and AAFP must work with vaccine manufacturers and distributors to decrease the financial risk involved in vaccine inventory, particularly for new products or for new uses of established products. This approach includes both more favorable terms for payments for vaccine inventories, and to encourage manufacturers to provide an initial set of “pay as you use” doses for new vaccine products.
- The AAP and AAFP must work with the AMA’s Relative Value Utilization Committee (RUC) to better define all of the components that go into CPT codes for vaccines and vaccine administration. This must include determining which codes reflect vaccine related overhead, including storage and inventory control, insurance costs, and other overhead components. The RUC must also consider new payment protocols that encourage the use of combination vaccines.
- The AAP and AAFP should collect and disseminate data on best business practices that minimize vaccine and vaccine-related costs.
- The AAP and others should convene a working group of key stakeholders, including manufacturers, to determine whether a viable form of universal federal vaccine purchase program should be pursued.
- To improve access to immunization for underinsured children, the AAP and state-level stakeholders should work with federally-qualified health centers (FQHCs) to delegate authority to public health clinics to serve underinsured children through the VFC program.
- The AAP will work with the National Vaccine Advisory Committee Working Group on Vaccine Financing to examine the potential role of tax credits for insurers and/or employers in improving access to immunization and eliminating underinsurance for immunizations.
Fig 1. Private practice setting inventory cost to immunize 1 child with all recommended vaccines from birth through adolescence (1980 vs 2006)

* Estimated average 1980 prices of 5 DTwP, 4 OPV, 1 MMR, 1 Td
** CDC derived average retail vaccine prices in private sector as of January 2007
*** Using combination vs individual vaccine products
Table 1. Immunization costs as reimbursed by various payers (2006)

<table>
<thead>
<tr>
<th>Vaccine Covered By</th>
<th>Private Insurance</th>
<th>VFC</th>
<th>Universal Purchase</th>
<th>Self-Pay</th>
</tr>
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<tbody>
<tr>
<td>Provider Reimbursed For</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Full Cost of Vaccine</td>
<td>Sometimes</td>
<td>NA</td>
<td>NA</td>
<td>Sometimes</td>
</tr>
<tr>
<td>Vaccine-Related Overhead</td>
<td>Rarely</td>
<td>No</td>
<td>No</td>
<td>Rarely</td>
</tr>
<tr>
<td>Full Costs of Administration</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Sometimes</td>
<td>Rarely</td>
</tr>
<tr>
<td>Total Costs for Immunizing Patients</td>
<td>Rarely</td>
<td>Never</td>
<td>Never</td>
<td>Rarely</td>
</tr>
</tbody>
</table>

N/A indicates not applicable.
APPENDIX A. Current Immunization Schedule

Recommended Immunization Schedule for Ages 0–6 Years UNITED STATES • 2007

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age</th>
<th>Birth</th>
<th>1 month</th>
<th>2 months</th>
<th>4 months</th>
<th>6 months</th>
<th>12 months</th>
<th>15 months</th>
<th>18 months</th>
<th>19-23 months</th>
<th>2-3 years</th>
<th>4-6 years</th>
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<tbody>
<tr>
<td>Hepatitis B</td>
<td>HepB</td>
<td>HepB</td>
<td>HepB</td>
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<tr>
<td>Rotavirus</td>
<td>Rota</td>
<td>Rota</td>
<td>Rota</td>
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<tr>
<td>Diphtheria, Tetanus, Pertussis</td>
<td>DTaP</td>
<td>DTaP</td>
<td>DTaP</td>
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<tr>
<td>Haemophilus influenzae type b</td>
<td>Hib</td>
<td>Hib</td>
<td>Hib</td>
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<tr>
<td>Pneumococcal</td>
<td>PCV</td>
<td>PCV</td>
<td>PCV</td>
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<tr>
<td>Inactivated Poliovirus</td>
<td>IPV</td>
<td>IPV</td>
<td>IPV</td>
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<tr>
<td>Influenza</td>
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<tr>
<td>Mumps, Measles, Rubella</td>
<td>MMR</td>
<td>MMR</td>
<td>MMR</td>
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<tr>
<td>Varicella</td>
<td>Varicella</td>
<td>Varicella</td>
<td>Varicella</td>
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<tr>
<td>Hepatitis A</td>
<td>HepA (2 doses)</td>
<td>HepA (2 doses)</td>
<td>HepA (2 doses)</td>
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<tr>
<td>Meningococcal</td>
<td>MPSV4</td>
<td>MPSV4</td>
<td>MPSV4</td>
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</table>

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children through 6 years. For additional information see www.cdc.gov/nip/recs/childschedule.htm. Any dose not administered at the recommended age should be administered at any subsequent visit when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and other components of the vaccine are not contraindicated and it approved by the Food and Drug Administration for such use. Providers should consult the respective ACP information for detailed recommendations. Orally-inactivated vaccine administration is recommended for children aged ≤59 months with certain high-risk groups. Providers should consult the respective ACP information for detailed recommendations.

1. Hepatitis B vaccine (HepB). (Minimum age: birth)
   - At birth: Administer monovalent HepB to all newborns prior to hospital discharge.
     - If mother is HBSAg-positive, administer HepB and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth.
     - If mother’s HBSAg status is unknown, administer HepB within 12 hours of birth. Determine the HBSAg status as soon as possible and if HBIG is positive, administer HBIG (no later than 1 week).
   - If mother is HBSAg-negative, the birth dose may be delayed with physician’s order and mother’s negative HBSAg laboratory report documented in the infant’s medical record.

2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)
   - Administer the first dose between 2 and 12 weeks of age. Do not start the series later than 12 weeks.
   - Administer the final dose in the series by 32 weeks of age. Do not administer a dose later than 32 weeks.
   - There is insufficient data on safety and efficacy outside of this age range.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccines (DTaP).
   - The fourth dose of DTaP may be administered as early as 12 months of age, provided 6 months have elapsed since the third dose.
   - Administer the final dose in the series at age 4–6 years.

4. Haemophilus influenzae type b conjugate vaccine (Hib). (Minimum age: 6 weeks)
   - If PRP-OMP (PedvaxHIB or ComVax) (Menactra) is administered at age 2 and 4 months, a dose at age 6 months is not required.
   - Tdap (Boostrix or Adacel) combination products should not be used for primary immunization but can be used as boosters following any Hib vaccine in children >12 months old.

5. Pneumococcal vaccine. (Minimum age: 6 months)
   - Administer PCV at ages 2, 4, and 6 months in certain high-risk groups. Administer PPV to certain high-risk groups aged ≥2 years. See MMWR 2000, 49(RR-9):1–3.

6. Influenza vaccine. (Minimum age: 6 months)
   - Administer inactivated influenza vaccine (IVAX) for 1 year for all children aged ≥6 months with certain high-risk factors, healthcare workers, and other persons (including household members) in close contact with persons in groups at high risk. See MMWR 2006, 55(RR-10):1–4.
   - For healthy persons aged 5–49 years, LAIV may be used as an alternative to TV.
   - Children receiving TV should receive 0.25 ml if aged 6–35 months or 0.5 mL if aged ≥3 years.
   - Children aged <3 years who are receiving influenza vaccine for the first time should receive 2 doses separated by ≥4 weeks for TV and ≥2 weeks for LAIV.

7. M. mumps, and rubella vaccine (MMR). (Minimum age: 12 months)
   - Administer the second dose of MMR at age 4–6 years. MMR may be administered prior to age 4–6 years, provided ≥2 months have elapsed since the first dose and both doses are administered at age ≥12 months.

8. Varicella vaccine. (Minimum age: 12 months)
   - Administer the second dose of the varicella vaccine at age 4–6 years. Varicella vaccine may be administered prior to age 4–6 years, provided ≥2 months have elapsed since the first dose and both doses are administered at age ≥12 months.
   - The second dose does not need to be repeated.

9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)
   - HepA is recommended for all children at 1 year of age (i.e., 12–23 months).
   - The 2 doses in the series should be administered at least 6 months apart.
   - Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits.
   - HepA is recommended for children aged ≥2 years who have clinical or household exposure to hepatitis A or who are household members of a person with chronic liver disease from hepatitis A.

10. Meningococcal polysaccharide vaccine (MPSV4). (Minimum age: 2 years)
    - Administer MPSV4 to children aged 2–10 years with terminal complement deficiencies or ataxic or functional asplenia and certain other high-risk groups. See MMWR 2005, 54(RR-7):1–21.

This schedule is approved by:
- Advisory Committee on Immunization Practices: www.cdc.gov/nip/acip
- American Academy of Family Physicians: www.aafp.org
- American Academy of Pediatrics: www.aap.org
- American Academy of Pediatrics: www.aap.org
- American Academy of Family Physicians: www.aafp.org

The Childhood and Adolescent Immunization Schedule is approved by:
- Advisory Committee on Immunization Practices: www.cdc.gov/nip/acip
- American Academy of Pediatrics: www.aap.org
- American Academy of Family Physicians: www.aafp.org
- American Academy of Pediatrics: www.aap.org
- American Academy of Family Physicians: www.aafp.org

2/28/2007
# Recommended Immunization Schedule for Ages 7–18 Years

## UNITED STATES • 2007

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age</th>
<th>7–10 years</th>
<th>11–12 years</th>
<th>13–14 years</th>
<th>15 years</th>
<th>16–18 years</th>
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<td>Human Papillomavirus</td>
<td>2 doses</td>
<td>HPV (3 doses)</td>
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<td>MPSV4</td>
<td>MCV4</td>
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<td>PPV</td>
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<tr>
<td>Influenza</td>
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<td>Influenza (Yearly)</td>
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<td>HepA Series</td>
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<tr>
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<td>HepB Series</td>
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<tr>
<td>Inactivated Poliovirus</td>
<td></td>
<td>IPV Series</td>
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<tr>
<td>Measles, Mumps, Rubella</td>
<td></td>
<td>MMR Series</td>
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<tr>
<td>Varicella</td>
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<td>Varicella Series</td>
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**FOOTNOTES**

1. Tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap). *(Minimum age: 10 years for BOOSTRIX® and 11 years for ADACEL™)*
   - Administer at age 11–12 years for those who have completed the recommended childhood DTP/Td/DTaP vaccination series and have not received a Td booster dose.
   - Adolescents 13–18 years who missed the 11–12 year Td/Tdap booster dose should also receive a single dose of Tdap if they have completed the recommended childhood DTP/Td/DTaP vaccination series.

2. Human papillomavirus vaccine (HPV). *(Minimum age: 9 years)*
   - Administer the first dose of the HPV vaccine series to females at age 11–12 years.
   - Administer the second dose 2 months after the first dose and the third dose 6 months after the first dose.
   - Administer the HPV vaccine series to males at age 13–18 years if not previously vaccinated.

3. Meningococcal vaccine. *(Minimum age: 11 years for meningococcal conjugate vaccine (MCV4); 2 years for meningococcal polysaccharide vaccine (MPSV4))*
   - Administer MCV4 at age 11–12 years and to previously unvaccinated adolescents at high school entry (15 years of age).
   - Administer MCV4 to previously unvaccinated college freshmen living in dormitories. MPSV4 is an acceptable alternative.
   - Vaccination against invasive meningococcal disease is recommended for children and adolescents aged ≥ 2 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. See MMWR 2006; 55(RR-10):1-21. Use MPSV4 for children aged 2–10 years and MCV4 or MPSV4 for older children.

4. Pneumococcal polysaccharide vaccine (PPV).

5. Influenza vaccine. *(Minimum age: 6 months)*
   - For those with certain medical conditions or at high risk of complications from influenza.
   - The first dose may be given at any time during the influenza season, and the second dose should be given at least 4 weeks after the first dose.

6. Hepatitis A vaccine (HepA). *(Minimum age: 2 years)*
   - The first dose may be given at any time during the influenza season, and the second dose should be given at least 4 weeks after the first dose.

   - The first dose may be given at any time during the influenza season, and the second dose should be given at least 4 weeks after the first dose.

8. Inactivated poliovirus vaccine (IPV). *(Minimum age: 2 years)*
   - For children who have not received an IPV or all-in-one poliovirus (OPV) series, complete the 4-dose series or an OPV/IPV series with a booster dose at age 4 years.

   - Administer 1 dose of MMR at age 12 months.

10. Varicella vaccine. *(Minimum age: 12 months)*
    - Administer 2 doses of varicella vaccine to persons without evidence of immunity.
    - Administer 2 doses of varicella vaccine to persons aged ≥ 13 years at least 3 months apart. Do not repeat the second dose, if administered ≥ 28 days following the first dose.
    - Administer 2 doses of varicella vaccine to persons aged ≥ 13 years at least 4 weeks apart.

The Childhood and Adolescent Immunization Schedule is approved by:

- Advisory Committee on Immunization Practices
- American Academy of Pediatrics
- American Academy of Family Physicians
- American Academy of Allergy, Asthma, & Immunology
- American College of Obstetricians and Gynecologists
- American Public Health Association
- Association of State and Territorial Health Officials
- National Association of County and City Health Officials
- National Foundation for Infectious Diseases
- Pediatric Infectious Disease Society

2/28/2007
APPENDIX B. Detailed Components of Vaccine Administration

Vaccine administration is a complex activity. Payment must reflect the service component of providing vaccines, defined as the value of labor, time, expertise, and resources expended to deliver and document the delivery of a vaccine product to a patient under current standards of practice and regulations. The components of this service include:

- Professional time (salary and fringe benefits) and expertise of providers, nurses, nurse practitioners, and/or provider assistants to provide up-to-date information to parents/patients about the value and safety of immunization
- Maintenance of the necessary office infrastructure
  o Personnel training—education, training, and periodic updating of skills
  o Periodic assessment of the quality and efficiency with which the office staff performs immunization tasks
  o Providing patient education materials, including vaccine information sheets (VISs)
  o Obtaining patient/parent consent to administer vaccines
  o Obtaining a signed immunization refusal form when immunization permission is denied
  o Documentation in the medical record and immunization registry, if available
- Receptionist and chart room staff time and expertise to:
  o Interface with patient/parent and record retrieval system, including immunization registries if available, to identify immunization needs at each patient encounter
  o Flag records that require immunization attention
- Supplies
  o Needles and syringes approved by the Occupational Safety and Health Administration
  o Alcohol
  o Adhesive bandages
  o Gloves
  o Examination table and examination table paper
- Immunization registry usage and fees (vary by state/region)
  o Hardware purchases needed for link-up on local, health region, or state registries
  o Software purchases to integrate electronic health record (EHR) system with registry
  o Usage fees for data entry into a commercial registry at each encounter
- Immunization quality improvement
  o Continuing medical education to update knowledge base about recommended vaccines and vaccine safety—especially important because of the recent rapid expansion of the immunization schedule
  o Reminder/recall system expenses, including follow-up calls and/or automatic dialer
  o Participation in Health Plan Employer Data and Information Set (HEDIS) and Comprehensive Clinic Assessment Software Application (CoCASA) immunization practice improvement tools to assess immunization rates
- Liability insurance for conditions not covered under the federal Vaccine Injury Compensation Program, such as failure to immunize out of personal beliefs, professional misjudgment, or vaccine shortage scenarios that result in patient injury or death from a vaccine-preventable disease

2/28/2007
Few studies have attempted to quantify the true cost of administering vaccines in the office setting; none have fully addressed all the components of work now recognized as necessary to provide immunization services to patients. Time-motion analysis of labor costs in a pediatric office plus fixed costs of materials and equipment were estimated in 2004 to be $10.67 per vaccine, with local reimbursement lower than the average total costs. Time-motion assessment alone in another study performed in 2001 suggested a cost of $5.60 per vaccine in the private sector, with insufficient reimbursement serving as a disincentive to provide vaccines in the private office. The 2000 and 2003 Institute of Medicine (IOM) reports on vaccine financing in the United States gave cursory attention to vaccine administration costs in the private sector.

The AAP faces constraints in recommending specific prices for services. However, Medicare is now paying approximately $20 per injection on the 2007 fee schedule. The AAP has concluded, on the basis of components of the service delivered, that the vaccine-related overhead adds approximately 18% to 25% to the cost of the vaccine itself.

2 The ACIP is advisory to the CDC and makes recommendations to the federal government concerning vaccines. When the ACIP approves a new vaccine, a vote is also taken on whether to include the vaccine in the VFC program, ensuring that the federal government will pay for the cost of vaccine products (not acquisition or administration costs of health care professionals) for all VFC-eligible children in the United States.
3 VFC-eligible children include children enrolled in Medicaid, uninsured children, American Indian/Alaska Native children, and underinsured children, if the immunization is given in a federally qualified health center.
4 Morbidity and mortality of vaccine-preventable diseases.
5 Lost years of productive work for victims of disease, lost time from work for family members of these victims.


CPT codes 90465 and 90471

CPT codes 90466 and 90472


Medicare payments vary by region of the country.