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Recommendations and Reports

Immunization of Adolescents

Recommendations of the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, the American Academy of Family Physicians, and the American Medical Association

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*These organizations, with the exception of the National Association of Pediatric Nurse Associates and Practitioners, are members of the National Coalition for Adult Immunization.

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Immunization of Adolescents

Recommendations of the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, the American Academy of Family Physicians, and the American Medical Association

Summary

This report concerning the immunization of adolescents (i.e., persons 11–21 years of age, as defined by the American Medical Association [AMA] and the American Academy of Pediatrics [AAP]) is a supplement to previous publications (i.e., MMWR *1994;43 [No. RR-1]1-38; the AAP* 1994 Red Book: Report of the Committee on Infectious Diseases; Summary of Policy Recommendations for Periodic Health Examination, August 1996 *from the American Academy of Family Physicians [AAFP]; and* AMA Guidelines for Adolescent Preventive Services [GAPS]: Recommendations and Rationale). *This report presents a new strategy to improve the delivery of vaccination services to adolescents and to integrate recommendations for vaccination with other preventive services provided to adolescents. This new strategy emphasizes vaccination of adolescents 11–12 years of age by establishing a routine visit to their health-care providers. Specifically, the purposes of this visit are to a) vaccinate adolescents who have not been previously vaccinated with varicella virus vaccine, hepatitis B vaccine, or the second dose of the measles, mumps, and rubella (MMR) vaccine; b) provide a booster dose of tetanus and diphtheria toxoids; c) administer other vaccines that may be recommended for certain adolescents; and d) provide other recommended preventive services. The recommendations for vaccination of adolescents are based on new or current information for each vaccine. The most recent recommendations from ACIP, AAP, AAFP, and AMA concerning specific vaccines and delivery of preventive services should be consulted for details (Exhibit 2).*

BACKGROUND

In the United States, vaccination programs that focus on infants and children have decreased the occurrence of many childhood, vaccine-preventable diseases (*1*). However, many adolescents (i.e., persons 11–21 years of age i.e., as defined by the American Medical Association [AMA] and the American Academy of Pediatrics [AAP]) and young adults (i.e., persons 22–39 years of age) continue to be adversely affected by vaccine-preventable diseases (e.g., varicella, hepatitis B, measles, and rubella), partially because vaccination programs have not focused on improving vaccination coverage among adolescents.

These recommendations for the immunization of adolescents were developed to improve vaccination coverage among adolescents and focus on establishing a routine visit to health-care providers (i.e., providers) for adolescents ages 11–12 years. Such a

visit provides the opportunity for a) ensuring vaccination of those adolescents not previously vaccinated with hepatitis B vaccine, varicella virus vaccine (if indicated), or the second dose of the measles, mumps, and rubella (MMR) vaccine; b) administering a tetanus and diphtheria toxoid (Td) booster; c) administering other vaccines that may be recommended for certain adolescents; and d) providing other recommended preventive services.

Flexibility in scheduling vaccinations is an important factor for improving vaccination coverage among adolescents. Because multiple-dose vaccines or simultaneous administration of several vaccines may be indicated for adolescents (Table 1), providers may need to be flexible in determining which vaccines to administer during the initial visit and which to administer on return visits.

IMMUNIZATION AS A PREVENTIVE HEALTH SERVICE FOR ADOLESCENTS

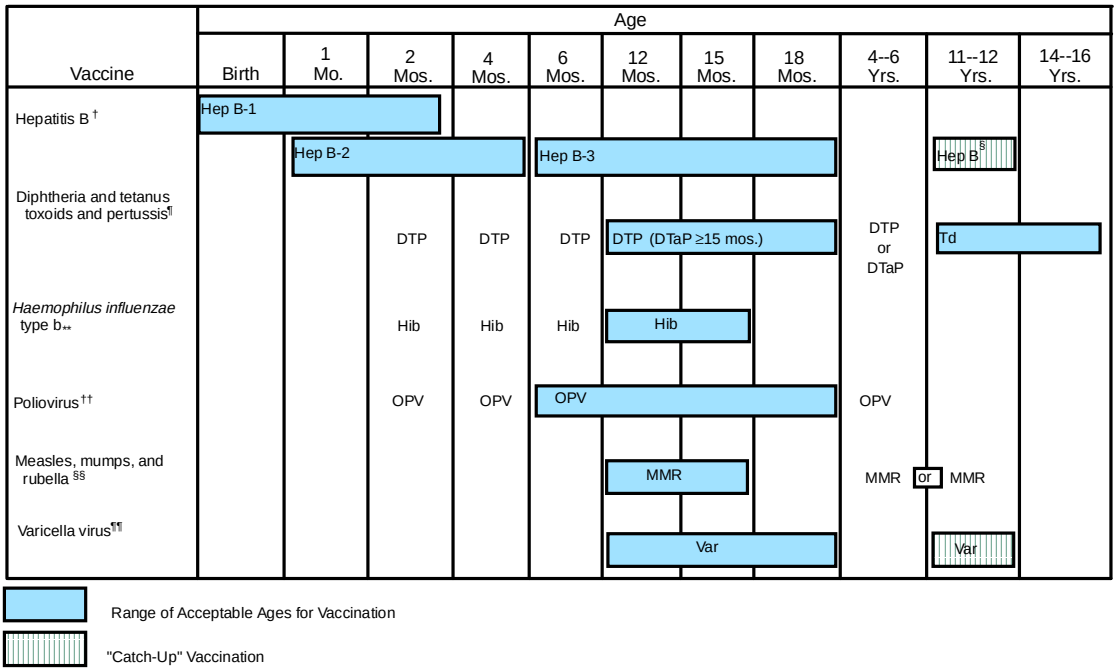
Administration of vaccinations should be integrated with other preventive services provided to adolescents. The importance of improving the vaccination levels and of providing other preventive services indicated for adolescents and young adults has been emphasized recently by many national organizations (Exhibit 1). In particular, AAP has advocated and provided specific recommendations for the vaccination of adolescents (*2,3*). Similarly, AMA and the Health Resources and Services Administration (HRSA) have proposed comprehensive recommendations that provide a framework for organizing the content and delivery of preventive health services (including vaccinations) for adolescents (*4,5*). The United States Preventive Services Task Force (USPSTF) has advocated specific vaccinations for adolescents that are based on the patient's age and risk factors (*6*). In addition, the American Academy of Family Physicians (AAFP) has recommended delivery of preventive services based on reviews by USPSTF and the AAFP Commission on Clinical Policies and Research (*7*). Guidelines recommended by these organizations include the delivery of preventive health services during a series of regular visits by adolescents to providers. These services include specific guidance on health behaviors; screening for biomedical, behavioral, and emotional conditions; and delivery of other health services, including vaccinations. The recommendations for vaccination of adolescents adopted by the Advisory Committee on Immunization Practices (ACIP), AAP, AAFP, and AMA are consistent with those of other groups that promote preventive health services for adolescents.

RATIONALE FOR VACCINE ADMINISTRATION DURING AN ADOLESCENT'S VISIT TO PROVIDERS

Hepatitis B Vaccine

In the United States, most persons infected with hepatitis B virus (HBV) acquired their infection as young adults or adolescents. HBV is transmitted primarily through sexual contact, injecting-drug use, regular household contact with a chronically in-

TABLE 1. Recommended childhood immunization schedule*—United States, July–December 1996



* This schedule is updated and published periodically. Vaccines are listed under the routinely recommended ages.

† **Infants born to hepatitis B surface antigen (HBsAg)-negative mothers** should receive the first dose (Hep B-1) of 2.5 µg of Recombivax HB® (Merck & Co.) or 10 µg of Engerix-B® (SmithKline Beecham). The second dose (Hep B-2) should be administered 1 month after the first dose. **Infants born to HBsAg-positive mothers** should receive 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth, and either 5 µg of Recombivax HB® or 10 µg of Engerix-B® at a separate site. The second dose is recommended at age 1–2 months and the third dose at age 6 months. **Infants born to mothers whose HBsAg status is unknown** should receive either 5 µg of Recombivax HB® or 10 µg of Engerix-B® within 12 hours of birth. The second dose of vaccine is recommended at age 1 month and the third dose (Hep B-3) at age 6 months.

§ Adolescents who have not received three doses of hepatitis B vaccine should initiate or complete the series at ages 11–12 years. The second dose should be administered at least 1 month after the first dose, and the third dose should be administered at least 4 months after the first dose and at least 2 months after the second dose.

¶ The fourth dose of diphtheria and tetanus toxoids and pertussis vaccine (DTP) may be administered at age 12 months if at least 6 months have elapsed since the third dose of DTP. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) is licensed for the fourth and/or fifth vaccine dose(s) for children ages ≥15 months and may be preferred for these doses in this age group. Tetanus and diphtheria toxoids, adsorbed, for adult use (Td) is recommended at ages 11–12 years if at least 5 years have elapsed since the last dose of DTP, DTaP, or diphtheria and tetanus toxoids, adsorbed, for pediatric use (DT).

** Three *H. influenzae* type b (Hib) conjugate vaccines are licensed for infant use. If PedvaxHIB® (Merck & Co.) *Haemophilus* b conjugate vaccine (Meningococcal Protein Conjugate) (PRP-OMP) is administered at ages 2 and 4 months, a dose at 6 months is not required. After completing the primary series, any Hib conjugate vaccine may be used as a booster.

†† Oral poliovirus vaccine (OPV) is recommended for routine vaccination of infants. Inactivated poliovirus vaccine (IPV) is recommended for persons—or household contacts of persons—with a congenital or acquired immune-deficiency disease or an altered immune status resulting from disease or immunosuppressive therapy and is an acceptable alternative for other persons. The primary three-dose series for IPV should be given with a minimum interval of 4 weeks between the first and second doses and 6 months between the second and third doses.

§§ The second dose of measles, mumps, and rubella vaccine (MMR) is routinely recommended at ages 4–6 years or at ages 11–12 years but may be administered at any visit provided at least 1 month has elapsed since receipt of the first dose.

¶¶ Varicella virus vaccine (Var) can be administered to susceptible children and adolescents at any time after age 12 months. Unvaccinated adolescents who lack a reliable history of chickenpox should be vaccinated at ages 11–12 years.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Source: Advisory Committee on Immunization Practices, American Academy of Pediatrics, and American Academy of Family Physicians.

fected person, or occupational exposure. However, the source of infection is unknown for approximately one third of persons who have acute hepatitis B (*8*).

A comprehensive vaccination strategy to eliminate transmission of HBV through routine vaccination of infants, adolescents ages 11–12 years, and adolescents who are at increased risk for HBV infection has been adopted (*3,7,9,10*). Any reduction in HBV-related liver disease resulting from universal vaccination of infants cannot be expected until vaccinated children reach adolescence and adulthood.

Routine vaccination of adolescents 11–12 years of age who have not been vaccinated previously is an effective strategy for more rapidly lowering the incidence of HBV infection and assisting in the elimination of HBV transmission in the United States (*3,10*). An adolescent's visit at ages 11–12 years gives the provider an opportunity to initiate protection against HBV before the adolescent begins high-risk behaviors. Unvaccinated adolescents >12 years of age who are at increased risk for HBV infection also should be vaccinated (*10*). Such adolescents are at increased risk for HBV infection and should be vaccinated against hepatitis B if they a) have multiple sexual partners (i.e., more than one partner in a 6-month period), b) use illegal injecting drugs, c) are males who have sex with males, d) have sexual or regular household contact with a person who is positive for hepatitis B surface antigen, e) are health-care or public-safety workers who are occupationally exposed to human blood, f) are undergoing hemodialysis, g) are residents of institutions for the developmentally disabled, h) are administered clotting factors, or i) travel to an area of high or intermediate HBV endemicity for ≥6 months. In addition, AAP recommends that providers administer hepatitis B vaccine to all adolescents for whom they provide services (*3*).

Adolescents can be vaccinated against hepatitis B in various settings, including schools and providers' offices. In the United States, school-based demonstration projects to vaccinate adolescents against hepatitis B have achieved >70% vaccination coverage (*11–13*).

Adolescents should receive three age-appropriate doses of hepatitis B vaccine (Table 2). Hepatitis B vaccine is highly immunogenic in adolescents and young adults when administered in varying three-dose schedules (*14,15*). A schedule of 0, 1–2, and 4–6 months is recommended. Flexibility in scheduling is an important factor for achieving high rates of vaccination in adolescents. When the vaccination schedule is interrupted, the vaccine series does not require reinitiation (CDC, unpublished data; *16*). Studies of "off-schedule" vaccinations indicate that if the series is interrupted after the first dose, the second dose should be administered as soon as possible, and the second and third doses should be separated by an interval of at least 2 months. If only the third dose is delayed, it should be administered as soon as possible. Intervals of up to 1 year between administration of the first and third doses induce excellent antibody responses (*15*), and studies are in progress to evaluate longer intervals.

Measles, Mumps, and Rubella Vaccine

The sustained decline of measles in the United States has been associated with a shift in occurrence from children to infants and young adults. During 1990–1994, 47% of reported cases occurred in persons ages ≥10 years, compared with only 10% during 1960–1964 (CDC, unpublished data; *17*). During the 1980s, outbreaks of measles occurred among school-age children in schools with measles-vaccination levels

TABLE 2. Recommended schedule of vaccinations for adolescents ages 11–12 years

Immunobiologic	Indications	Name	Dose	Frequency	Route
Hepatitis A vaccine	Adolsecents who are at increased risk of hepatitis A infection or its complications	HAVRIX®*	720 EL.U.†/0.5 mL§	A total of two doses at 0,¶ 6–12 mos	IM**
		VAQTA®*	25 U/0.5 mL	A total of two doses at 0, 6–18 mos	IM
Hepatitis B vaccine	Adolescents not vaccinated previously for hepatitis B	Recombivax HB®*	5 μg/0.5 mL	A total of three doses at 0, 1–2, 4–6 mos	IM
		Engerix-B®*	10 μg/0.5 mL	A total of three doses at 0, 1–2, 4–6 mos	IM
Influenza vaccine	Adolescents who are at increased risk for complications caused by influenza or who have contact with persons at increased risk for these complications	Influenza virus vaccine††	0.5 mL	Annually (September–December)	IM
Measles, mumps, and rubella vaccine (MMR)	Adolescents not vaccinated previously with two doses of measles vaccine at ≥12 mos of age	MMR II®*	0.5 mL	One dose	SC§§
Pneumococcal polysaccharide vaccine	Adolescents who are at increased risk for pneumococcal disease or its complications	Pneumococcal vaccine polyvalent††	0.5 mL	One dose	IM or SC
Tetanus and diphtheria toxoids (Td)	Adolescents not vaccinated within the previous 5 yrs	Tetanus and diphtheria toxoids, adsorbed (for adult use)††	0.5 mL	Every 10 yrs	IM
Varicella virus vaccine	Adolescents not vaccinated previously and who have no reliable history of chickenpox	VARIVAX®*	0.5 mL	One dose¶¶	SC

* Manufacturer's product name.
† Enzyme-linked immunosorbent assay (ELISA) unit.
§ Alternative dosage and schedule of 360 EL.U./0.5 mL and a total of three doses administered at 0, 1, and 6–12 months.
¶ 0 months represents timing of the initial dose, and subsequent numbers represent months after the initial dose.
** Intramuscular injection.
†† Generic name.
§§ Subcutaneous injection.
¶¶ Adolescents ≥13 years of age should be administered a total of two doses (0.5 mL/dose) subcutaneously at 0 and 4–8 weeks.

of ≥98% (*18*). Primary vaccine failure was considered the principal contributing factor in these outbreaks. As a result, beginning in 1989, a two-dose measles-vaccination schedule for students in primary schools, secondary schools, and colleges and universities was recommended (*18–20*). This two-dose vaccination schedule provides protection to ≥98% of persons vaccinated. Administration of a second dose of MMR at entry to elementary school (i.e., at ages 4–6 years) or junior high or middle school (i.e., at ages 11–12 years) is recommended(*21–23*). State policies for implementing the two-dose strategy have varied; some states require the second dose for entry into primary school, and others require it for entry into middle school. Because the recommendation for a second dose of MMR was made in 1989, many children born before 1985 (and some children born after 1985, depending on local policy) may not have received the second vaccine dose. The routine visit to providers at ages 11–12 years affords an opportunity to administer a second dose of MMR to adolescents who have not received two doses of MMR at ≥12 months of age.

MMR should not be given to adolescents who are known to be pregnant or to adolescents who are considering becoming pregnant within 3 months of vaccination. Asking adolescents if they are pregnant, excluding those who say they are, and explaining the theoretical risk of fetal infection to the other female adolescents are recommended precautions.

Tetanus and Diphtheria Toxoids

Although booster doses of Td are recommended at 10-year intervals, no special strategies have been developed to ensure that this recommendation is fully implemented. During 1991–1994, 191 (95%) of the 201 reported cases of tetanus in the United States occurred in persons ages ≥20 years, and nine (45%) of the 20 reported cases of diphtheria occurred in persons ages ≥20 years (CDC, unpublished data). Data from a serosurvey conducted in Minnesota indicated that 62% of persons 18–39 years of age lacked adequate protection against diphtheria (*24*).

Epidemic diphtheria has reemerged in the New Independent States (NIS) of the former Soviet Union and has resulted in >47,000 cases reported in 1994 and >50,000 in 1995 (CDC, unpublished data; *25*). Although no imported cases were reported in the United States during those years, ≥20 cases of diphtheria were reported in Europe, and two cases occurred among U.S. citizens who resided or were traveling in the NIS. This threat of infection underscores the importance of maintaining high levels of diphtheria immunity in the U.S. population.

Recent data from CDC's National Health and Nutrition Examination Survey (NHANES III) suggested that immunity to tetanus varied with age (*26*). Among children ages 6–16 years, 82% had protective levels of tetanus antitoxin (defined as a serum level >0.15 IU per mL). Immunity in persons decreased at ages 9–13 years, with 15%–36% of these persons unprotected (CDC, unpublished data). Immunity also varied inversely with the length of time since the last tetanus vaccination. Among children who were reported as being vaccinated 6–10 years before the serologic survey, 28% lacked immunity to tetanus, compared with 14% who were reported as being vaccinated 1–5 years before the survey and 5% who were reported as being vaccinated ≤1 year before the survey (*27*). A Td booster is essential to ensure long-lasting immunity against tetanus. Lowering the age for administration of the first Td booster

from ages 14–16 years to ages 11–12 years should increase compliance and thereby reduce the susceptibility of adolescents to tetanus and diphtheria.

Administering the Td booster at ages 11–12 years provides a rationale for a routine visit to providers for adolescents, regardless of their need for other vaccines. Data suggest there should be no increased risk for serious side effects to Td when the first booster dose is administered at ages 11–12 years rather than at ages 14–16 years (CDC, unpublished data).

With the exception of the Td booster at ages 11–12 years, routine boosters should be administered every 10 years. If a dose of Td has been administered after receipt of tetanus- and diphtheria-containing vaccine at ages 4–6 years and before the routine Td booster at ages 11–12 years, the dose at ages 11–12 years is not indicated. The next dose should follow the last dose by 10 years, unless specifically indicated because of a tetanus-prone injury (i.e., persons who sustain a tetanus-prone injury should be administered a Td booster immediately if >5 years have elapsed since their last Td booster).

Varicella Virus Vaccine

Before varicella virus vaccine became available in 1995, most persons in the United States contracted varicella (i.e., chickenpox), resulting in an estimated 4 million infections annually. At present, approximately 20% of adolescents ages 11–12 years remain susceptible to varicella (CDC, unpublished data). The rate of complications, including death, is greater for persons who contract chickenpox when they are ≥15 years of age.

Varicella virus vaccine should be administered to adolescents ages 11–12 years if they have not been vaccinated and do not have a reliable history of chickenpox (*7, 27,28*). At ages 11–12 years, providers should assess the adolescent's need for varicella virus vaccine and administer the vaccine to those who are eligible. When administered to children <13 years of age, a single dose of vaccine induces protective antibodies in >95% of recipients. For susceptible persons ≥13 years of age, two doses separated by 4–8 weeks are recommended.

Varicella vaccine should not be given to adolescents who are known to be pregnant or to adolescents who are considering becoming pregnant within 1 month of vaccination. Asking adolescents if they are pregnant, excluding those who say they are, and explaining the potential effects of the vaccine virus on the fetus to the other female adolescents are recommended precautions.

OTHER VACCINES INDICATED FOR CERTAIN ADOLESCENTS

Influenza Vaccine

More than 8 million children and adolescents in the United States, including 2.2 million persons ages 10–18 years who have asthma (CDC, unpublished data), have at least one medical condition that places them at high risk for complications associated with influenza. Such adolescents should be vaccinated annually for influenza; however, few actually receive the vaccine.

Adolescents at high risk who should be administered influenza vaccine annually are those who a) have chronic disorders of the pulmonary system (including those who have asthma) or the cardiovascular system; b) reside in chronic-care facilities that house persons of any age who have chronic medical conditions; c) have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic disease(s) (including those who have diabetes mellitus), renal dysfunction, hemoglobinopathy, or immunosuppression (including those who have immunosuppression caused by medication); or d) receive long-term aspirin therapy and, therefore, may be at risk for contracting Reye syndrome after influenza. In addition, adolescents who have close contact* with persons who meet any of these conditions or with persons ≥65 years of age should be administered influenza vaccine annually. Students in institutional settings (e.g., those residing in dormitories) should be encouraged to receive influenza vaccine annually to minimize any disruption of routine activities during epidemics. In addition, any adolescent may be vaccinated annually to reduce the likelihood of acquiring influenza infection.

Administration of influenza vaccine to adolescents ages 11–12 years may assist in establishing the lifetime practice of annual influenza vaccination in persons for whom it is indicated. Providers should administer influenza vaccine to adolescents who visit them for routine care if vaccination is indicated and if their visit is during the time of year appropriate for influenza vaccination (i.e., September–December); such adolescents should be scheduled for an additional visit if they are seen at a time of year when vaccination is not indicated. Adolescents may receive influenza vaccine at the same time they receive other recommended vaccines. Additional strategies are needed to improve delivery of influenza vaccine to adolescents for whom it is indicated.

Pneumococcal Polysaccharide Vaccine

Approximately 340,000 persons 2–18 years of age have chronic illnesses associated with increased risk for pneumococcal disease or its complications and should receive the 23-valent pneumococcal vaccine. Adolescents who should be vaccinated include those who have a) anatomic or functional asplenia (including sickle cell disease), b) nephrotic syndrome, c) cerebrospinal-fluid leaks, or d) conditions associated with immunosuppression (including human immunodeficiency virus [HIV]).

Revaccination is recommended for adolescents at highest risk for serious pneumococcal infection and those likely to experience rapid decline in pneumococcal-antibody levels, provided ≥5 years have passed since administration of the first dose of pneumococcal vaccine. The possible need for subsequent doses following revaccination requires further study. Persons at highest risk and persons likely to have a rapid decline in pneumococcal-antibody levels include those who have a) splenic dysfunction or anatomic asplenia, b) sickle cell disease, c) HIV infection, d) Hodgkin's disease, e) lymphoma, f) multiple myeloma, g) chronic renal failure, h) nephrotic syndrome, or i) other conditions associated with immunosuppression (e.g., undergoing organ transplantation or receiving immunosuppressive chemotherapy).

*Close contact occurs when persons live with, work with, or otherwise are frequently in close physical proximity to other persons.

Hepatitis A Vaccine

Each year, approximately 140,000 persons in the United States are infected with hepatitis A virus (HAV). The highest rates of disease occur among persons 5–14 years of age. Most cases of hepatitis A can be attributed to person-to-person transmission.

Adolescents who plan to travel to or work in a country that has high or intermediate endemicity of hepatitis A virus (HAV) infection* should be administered hepatitis A vaccine or immune globulin (*29*). For adolescents who plan to travel repeatedly to or reside for long periods in such areas, administration of hepatitis A vaccine rather than immune globulin is preferred (*29*).

Unvaccinated adolescents who reside in a community that has a high rate of HAV infection and periodic outbreaks of hepatitis A disease also should be vaccinated. During outbreaks in such a community, age-specific disease rates provide an indirect indication of the age groups in which a large percentage of the group has prior immunity and, therefore, would benefit little from vaccination. Often the upper-age cutoff for hepatitis A vaccination is between 10 years of age and 15 years of age. In addition, adolescents should be vaccinated against hepatitis A if they a) have chronic liver disease, b) are administered clotting factors, c) use illegal injecting or noninjecting drugs (i.e., if local epidemiologic data indicate current or past outbreaks have occurred among persons who have such risk behaviors), or d) are males who have sex with males.

SCHEDULING VACCINATIONS

Simultaneous Administration of Vaccines

Extensive clinical experience and experimental evidence from studies of infants and children have strengthened the scientific basis for administering certain vaccines simultaneously. Although specific studies have not been conducted regarding the simultaneous administration of all vaccines recommended for routine use in adolescents, no evidence has established that this practice is unsafe or ineffective (*30*).

All indicated vaccinations should be administered at the scheduled immunization visit for adolescents who are 11–12 years of age. However, some adolescents may require multiple (i.e., four or more) vaccinations, and the provider may choose not to administer all indicated vaccines during the same visit. In these circumstances, the provider may prioritize which vaccines to administer during the visit and schedule the adolescent for one or more return visits. Factors to consider in this decision include which vaccines require multiple doses, which diseases pose an immediate threat to the adolescent, and whether the adolescent is likely to return for scheduled visits.

Documentation of Previous Vaccinations

Providers may encounter adolescents who do not have documentation of previously received vaccines. In these circumstances, providers should attempt to assess each adolescent's vaccination status through documentation obtained from the parent, previous providers, or school records. If documentation of an adolescent's

*This includes countries other than Australia, Canada, Japan, New Zealand and those located in western Europe.

vaccination status is not available at the time of the visit, the following strategy is recommended while awaiting documentation: a) for those vaccinations required by law or regulation that the adolescent previously was subject to, assume that the adolescent has been vaccinated (unless required vaccinations have not been administered for religious, philosophic, or medical reasons) and withhold those vaccinations; and b) administer those vaccines that the adolescent previously was not subject to by law or regulation.

STATE VACCINATION LAWS AND REGULATIONS

In the United States, state vaccination laws and regulations for kindergarten through grade 12 are effective in ensuring high coverage levels among school attendees and have led to a marked decline of overall morbidity and mortality from vaccine-preventable diseases. Additional state laws and regulations requiring documentation of up-to-date immunization of adolescents or a reliable history of disease-related immunity at entry into sixth or seventh grade would ensure implementation of these recommendations and would lead to further reduction in transmission of vaccine-preventable disease.

RECOMMENDATIONS FOR VACCINATION OF ADOLESCENTS

The recommendations for administering each vaccine are consistent with current ACIP, AAP, AAFP, and AMA documents (Exhibit 2). However, the Td recommendation has been changed recently such that the ages at which the first Td booster is administered may be lowered from 14–16 years to 11–12 years (*21–23*). General recommendations and vaccine-specific recommendations for providers are as follows:

General Recommendations

- Establish a visit to providers for adolescents ages 11–12 years to screen for immunization deficiencies, and administer those indicated vaccines that have not been received (Table 1). During the initial visit, schedule appointments to receive needed doses of vaccine that are not administered during the initial visit. Provide other indicated preventive services during this and all other visits.
- Check the vaccination status of adolescents during each subsequent visit to providers and correct any deficiencies, including those associated with the three-dose series of hepatitis B vaccinations.

Vaccine-Specific Recommendations

- **Hepatitis B vaccine**. Vaccinate adolescents 11–12 years of age who have not been vaccinated previously with the three-dose series of hepatitis B vaccine. Ensure completion of the series by scheduling the vaccinations that are needed and by following up on those adolescents who do not receive these scheduled vaccinations. In addition, adolescents >12 years of age who are at increased risk for HBV infection should be vaccinated.

- **MMR (second dose)**. Administer the second dose of MMR to adolescents who have not received two doses of MMR at ≥12 months of age.
- **Td booster**. Administer a booster dose of Td vaccine to adolescents at ages 11–12 or 14–16 years if they have received the primary series of vaccinations and if no dose has been received during the previous 5 years. All subsequent, routine Td boosters (i.e., in the absence of tetanus-prone injury) should be administered at 10-year intervals.
- **Varicella virus vaccine**. Administer varicella virus vaccine to adolescents ages 11–12 years who do not have a reliable history of chickenpox and who have not been vaccinated with varicella virus vaccine.
- **Influenza vaccine**. Administer influenza vaccine annually to adolescents who, because of an underlying medical condition, are at high risk for complications associated with influenza. If seen at a time of year when vaccination is not indicated, schedule the adolescent for an influenza vaccination at the appropriate vaccination time (i.e., September–December). Vaccinate adolescents who have close contact with persons at high risk for complications associated with influenza. This vaccine also may be administered to adolescents who have no underlying medical condition to reduce their risk for influenza infection.
- **Pneumococcal polysaccharide vaccine**. Administer pneumococcal vaccine to adolescents who have chronic illnesses associated with increased risk for pneumococcal disease or its complications. Use adolescents' visits to providers to ensure that the vaccine has been administered to persons for whom it is indicated.
- **Hepatitis A vaccine**. Administer hepatitis A vaccine to unvaccinated adolescents who a) plan to travel to or work in a country that has high or intermediate endemicity of HAV infection*; b) reside in a community that has a high rate of HAV infection and periodic outbreaks of hepatitis A disease; c) are administered clotting factors; or d) have any of the following conditions or risk behaviors: chronic liver disease, use of illegal injecting or noninjecting drugs (i.e., if local epidemiologic data indicate current or past outbreaks of hepatitis A disease have occurred among persons who have such risk behaviors), or if they are males who have sex with males.

*Immune globulin is an alternative if a single, short visit is planned.

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Exhibit 1: National Organizations That Advocate Preventive Services for Adolescents

Organization	Publication
Advisory Committee on Immunization Practices (ACIP)	Update on Adult Immunization (*31*)
American Academy of Family Physicians (AAFP)	Summary of Policy Recommendations for Periodic Health Examination (*7*)
American Academy of Pediatrics (AAP)	Recommendations for Preventive Pediatric Health Care: Committee on Practice and Ambulatory Medicine (*2*)
American College Health Association (ACHA)	Position Statement on Immunization Policy (*32)*
American College of Physicians (ACP)	Guide for Adult Immunization (*33*)
American Medical Association (AMA)	AMA Guidelines for Adolescent Preventive Services: Recommendations and Rationale (*4*)
Council of State and Territorial Epidemiologists (CSTE)	Position statement approval during Council of State and Territorial Epidemiologists Annual Meeting, Austin, Texas, May 16, 1995
Health Resources and Services Administration (HRSA) and Health Care Financing Administration (HCFA)	Bright Futures: Guidelines for Supervision of Infants, Children and Adolescents (*5*)
National Vaccine Advisory Committee (NVAC)	Adult Immunization (*34*)
United States Preventive Services Task Force (USPSTF)	Guide to Clinical Preventive Services (*6*)

Exhibit 2: ACIP, AAP, AAFP, and AMA Documents

ACIP

CDC. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1994;43(No. RR-1).
CDC. Measles prevention: recommendations of the Immunization Practices Advisory Committee (ACIP). MMWR 1989;38(No. S-9).
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CDC. Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1996;45(No. RR-11).
CDC. Pneumococcal polysaccharide vaccine: recommendations of the Immunization Practices Advisory Committee. MMWR 1989;38:64–68,73–6.
CDC. Mumps prevention: recommendations of the Immunization Practices Advisory Committee (ACIP). MMWR 1989;38:388–92,397–400.
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CDC. Prevention and control of influenza: part 1, vaccines—recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1993;42(No. RR-6).
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AAP

American Academy of Pediatrics. In: Peter G, ed. 1994 Red book: report of the Committee on Infectious Diseases. 23rd ed. Elk Grove Village, IL: American Academy of Pediatrics, 1994.
Recommended childhood immunization schedule—United States, July–December 1996. Pediatrics 1996;98:158–60.
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Recommendations for the use of live attenuated varicella vaccine. American Academy of Pediatrics Committee on Infectious Diseases. Pediatrics 1995;95:791–6.

AAFP

American Academy of Family Physicians. Summary of policy recommendations for periodic health examination. Kansas City, MO: American Academy of Family Physicians, August 1996. (AAFP order no. 962, reprint no. 510).

American Academy of Family Physicians. Recommended immunization schedule, United States, July–December 1996. (AAFP order no. 974, reprint no. 520).

AMA

American Medical Association. Rationale and recommendations: infectious diseases. In: Elster AB, Kuznets NJ, eds. AMA guidelines for adolescent preventive services (GAPS): recommendations and rationale. Chicago, IL: Williams & Wilkins; 1994:165–71.

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