The ITAT sharp shooter

VOLUME 8, ISSUE 2, SUMMER 2007

The newsletter of the Immunization Technical Assistance Team (ITAT), a partnership of leaders from various organizations who are dedicated to improving and maintaining maximum immunization rates utilizing practice-based interventions

New Vaccine Requirements for Colorado Schools and Child Cares 2007–2008 School Year

by Jamie Damico, RN, MSN, CNS

On January 17th, 2007, the Colorado Department of Public Health and Environment's Board of Health approved additional vaccine requirements for children in child care settings and schools, beginning in the 2007–2008 school year. This article will briefly describe the diseases and the required vaccines that will prevent them. They include Prevnar (PCV7), Varicella and Tetanus/Diphtheria/Pertussis (Tdap).

Pneumococcal Disease (Prevnar/PCV7)

Pneumococcal disease is a contagious disease that can have serious effects in infants and young children. The vaccine, Prevnar (PCV7), is an effective immunization administered in a series to prevent this disease which can include bacteremia, acute otitis media and bacteremic pneumonia. Nationally, the Centers for Disease Control & Prevention (CDC) recommend the routine vaccination of preschool children with the PCV7 vaccine. It will now be required for children through 23 months of age in licensed child care facilities, and the number of doses depends on when the vaccine was initially administered.

Chickenpox (Varicella)

Varicella or chickenpox is a disease that is very contagious and outbreaks of the disease continue to occur in Colorado, as well as in other states. Because of continued outbreaks, even in children who have had one injection of Varicella vaccine, CDC recommends a routine second dose of Varicella vaccine. Colorado will require a second dose of Varicella vaccine, beginning at kindergarten entry in the new school year (SY 2007–08). This second dose will be implemented on an integrated schedule, and every year an additional grade will be required to comply with the requirement.

Beginning in the new school year (SY 2007–2008), if a child has had chickenpox disease, a laboratory test showing immunity or a documented disease history from a health care provider is acceptable. CDC has recommended routine vaccination of all children who do not have documented disease history by a medical provider or a laboratory test documenting immunity. In Colorado, children will need to have the appropriate documentation of chickenpox disease or two doses of Varicella vaccine at kindergarten entry.

Tetanus/Diphtheria/Pertussis (Tdap)

Pertussis, or whooping cough, can be a very serious disease in infants and small children. It has been found that, frequently, siblings who have Pertussis disease can expose other children in the household. CDC recommends all 11–12 year-old adolescents receive a dose of Tdap. In Colorado, Tdap vaccine will be required for all incoming sixth and tenth-graders this upcoming school year (SY 2007–2008). The general recom-

*See **New Vaccine Requirements** on page 2*

New Vaccine Requirements *from page 1*

mendation for the minimum interval between Td and Tdap is 5 years. However, because of the high incidence of pertussis in Colorado, it is appropriate to immunize children who are included in the CDPHE Tdap school requirement using a minimum interval between Td and Tdap of 2 years. In 2006 (provisional data), the national rate of pertussis was 4 cases per 100,000 persons, compared to Colorado's rate of 15 cases per 100,000 persons. As in previous years, infants younger than one year of age had the highest incidence rate (62 per 100,000), followed by the 10 to 14 year-old age group (44 cases per 100,000), and the 15 to 10 year-old age group (30 cases per 100,000).

In some cases, a 6th grader will be 10 years old. In the immunization schedule cited in the board of health rules, the requirement applies to 6th graders who are typically 11 year-olds. Boostrix, a Tdap vaccine licensed for ages 10 through 18 years, can be given to 10 year-olds entering 6th grade, however, many medical and immunization practices carry Adacel, which is licensed for individuals 11 through 64 years of age. The importance of requiring this vaccine for 11 year-olds is that this is the age when the pre-adolescent visit with the health care provider occurs. It is an ideal time to administer the Tdap vaccine, and very likely the Menactra vaccine, both of which should be administered at the same visit. If a parent of a 10 year-old chooses to wait until their 6th grader is 11 years old to receive the Tdap vaccine, documentation for this plan should be submitted to the school by the parent. This documentation of the immunization plan can come from either the health care provider or the parent.

Whenever vaccines are newly required, many questions arise. A FAQ sheet has been developed and is included in this publication as an insert. The schedules for each of these vaccines can be accessed on the first page of the Colorado Immunization Program Web under, "Additional Immunization Requirements for Schools and Day Care." The website address is:

http://www.cdphe.state.co.us/dc/immunization ✪

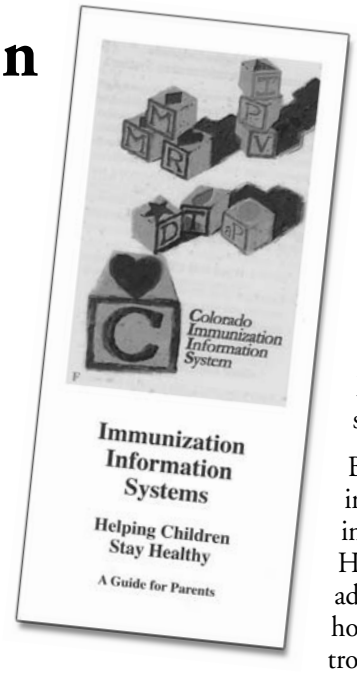
The Colorado Immunization Information System (CIIS)

by Kellyn A. Pearson, MSN, PNP

The Colorado Immunization Information System (CIIS) is a Web-enabled statewide information system that collects and consolidates immunization information for Colorado children. CIIS receives demographic information from Vital Statistics at the Colorado Department of Public Health and Environment to initiate a child's record. Immunization information is obtained from public and private immunization providers. Over the past three years, participation in CIIS has increased significantly. All public and community health center sites, 60 percent of all pediatric sites and 25 percent of all family practice sites that administer immunizations have agreed to participate in CIIS. Sixty-four percent of children less than 6 years of age have a record with two or more immunizations in CIIS. The percent of children with complete immunization histories will continue to increase as CIIS expands to include all immunization providers in Colorado over the next two years.

Offices can enter immunization information either by using the "live" Web application or by sending data from their electronic medical records or patient management system electronically. The immunization information is consolidated, so that each child has one record in CIIS.

Parents can choose to exclude their child's immunization information from CIIS (opt-out) by completing and returning the appropriate documents to CIIS. A parent brochure describing the benefits of CIIS and how to exclude immunization information from CIIS is included in packets that are distributed to new mothers by birth hospitals across the state.



Beginning with births in 2007, CIIS receives information for Hepatitis B vaccine administered in a birth hospital through the electronic birth certificate. Providers will be able to see this information when they review the child's CIIS record.

Recall of patients who have missed immunizations is a "best practice" to improve immunization rates. CIIS coordinators are currently working with offices around the state to implement recall as an ongoing quality improvement activity.

If your office needs additional information about participating in CIIS or about using CIIS recall, please contact Kellyn Pearson at 303-724-1075, kellyn.pearson@uchsc.edu. An immunization coordinator will contact you to work with your office to implement CIIS and recall. ✪

Documentation of the Hepatitis B Birth Dose on the New Birth Certificate

by Wendy Griffin, RN, BSN, MSPH

A birth dose of hepatitis B is recommended by The American Academy of Pediatrics, the American Academy of Family Physicians and the U.S. Centers for Disease Control and Prevention. The hepatitis B vaccine prevents a serious infection that can lead to chronic liver disease. When infants are infected with the hepatitis B virus, up to 90 percent of them will develop a chronic infection. Even without symptoms, these infections can lead to an early death from chronic liver disease.

Every newborn should be vaccinated against the hepatitis B virus at birth and before leaving the hospital. The first dose of hepatitis B vaccine should be delayed only in rare cases and only if the provider has documentation that the mother is HBsAg-negative. If the provider chooses not to vaccinate, an order to withhold the birth dose should be placed in the infant's chart along with a copy of the original laboratory report showing that the mother was HBsAg-negative with the current pregnancy.

The Viral Hepatitis Program at the Colorado Department of Public Health and Environment is working with hospitals to provide hepatitis B vaccine. As of December 2006, 46 out of 57 Colorado birthing hospitals were offering the first dose of hepatitis B vaccine to infants before hospital discharge. All 57 birthing hospitals have policies in place for treating babies born to mothers with hepatitis B surface antigen. This treatment includes giving the first dose of hepatitis B vaccine and one dose of hepatitis B immune globulin. These should be given within 12 hours of birth. This treatment is up to 95 percent effective in preventing the newborn from becoming infected with the hepatitis B virus.

In the past, providers were concerned about tracking the first hepatitis B dose given in the hospital. Beginning in January 2007, birth registrars are documenting whether the hepatitis B vaccine was given and the date of vaccination. The hepatitis B birth dose data from the birth certificate will be transferred to the Colorado Immunization Information System for authorized providers to access. Having this information on the birth certificate and in CIIS will make it easier for providers to track a child's immunizations.

The birth certificate will also include the mother's hepatitis B test results. Hepatitis B is a reportable condition in Colorado. The Viral Hepatitis Program, Perinatal Hepatitis B Prevention Unit, provides case management services to pregnant women with hepatitis B infection. The program will use the information from the birth certificate to identify new cases and provide education, free testing and immunization for all household and sexual contacts.

If you have questions about the hepatitis B birth dose or the Perinatal Hepatitis B Prevention Unit, please call 303-692-2780 or visit the website at:

http://www.cdphe.state.co.us/dc/Hepatitis/index.html ✪

Improving Documentation of Immunizations in Child Care Centers

by Lynn Trefren, RN, MSN

Tri-County Health Department created a committee including staff from environmental health, epidemiology and the nursing division to formulate a plan to improve immunization documentation in licensed child care facilities. A pilot study was conducted from August to November of 2005. Centers were notified by letter that Tri-County would be reviewing immunization records as part of its annual environmental health and safety inspections.

During September, a nurse visited each center in the pilot. The nurse reviewed immunization records, provided the center with a list of children who were delinquent or did not have an immunization record on file, provided a letter to the parent of each child on the list, and provided immunization and resource information for the center. The nurse completed a follow-up visit with each center at the time of the environmental health inspection to complete a second immunization review.

Data were collected for each center, including number of children, number of immunization certificates on file, number of children documented as up-to-date for age-appropriate immunizations, and time spent by the nurse for each center. Following the completion of all visits in the pilot, the committee met to formulate recommendations, which included the implementation of a program to review immu-

*See **Immunization Documentation** on page 4*

Immunization Documentation *from page 3*

nization records in licensed child care facilities in the Tri-County area.

In the pilot, the average cost per center was determined to be $260, and the average time was 7.25 hours. This information was used to determine the number of nurses that would be needed for an ongoing program. In addition to adding an immunization review by a nurse, the environmental health inspections were changed from bi-annual to annual. The cost of these changes was used to determine the fees that would be charged to each child care center to support the program. The Tri-County Board of Health approved the fees.

The pilot data was also used to set the program standards. For the initial program year, the standard for percentage of immunization certificates on file was set at 95 percent and for percentage of children up to date for age-appropriate immunizations based on available documentation was set at 75 percent. The nurse visit timeline was changed to ensure that both an initial and follow-up visit could be completed before the environmental health inspection. Tri-County will not approve child care facilities for licensing if the immunization records do not meet the program standards.

A database was developed to share results between environmental health, nursing and epidemiology. Epidemiology staff provides ongoing data analysis. Data from the first seven months of this program include 87 centers and over 6000 children. Approximately half of the centers met the program standards on the initial visit (51.7 percent). Nine centers have needed three or four visits. For centers that needed two or more nurse visits, the average percent of certificates on file have improved from 86.9 percent to 97.7 percent and the average percentage of up-to-date children improved from 64.2 percent to 86.1 percent. In June of 2007, data will be available for a full year and evaluation is ongoing.

Sharp Shooter Marksman Corner
Highlighting Outstanding Work

by Michelle Wilson, RN
Summit County Public Health Nursing Service

As part of the Colorado Department of Public Health and Environment Immunization Program Outreach Project for 2006–07, the Summit County Public Health Nursing Service in Frisco, Colorado proposed to raise the knowledge level of children's parents/guardians in Summit County. A variety of educational strategies were proposed, including advertising and educational programs for parents as well as other human service providers. Summit County already provides both non-traditional immunization clinic hours as well as off-site immunization clinics.

It became apparent, however, that Summit County needed to somehow tie all of this together. The nursing service needed to "brand" immunizations in Summit County. The original plan to adapt an already existing poster to include the county logo and office information did not work. The project was completed with a graphic designer who took a stick figure drawing and turned it into a wonderful, colorful poster that really embodies the children of Summit County (see the poster at right)!

The poster is now displayed on all county buses. We have a free bus service that has a ridership of over 3 million per year. Talk about exposure!

The posters have been reproduced and will be laminated, to keep them looking fresh, to distribute to all private provider offices, child care centers and preschools. We are checking into the cost of using the posters on grocery carts and, additionally, we are placing simple paper posters in places frequented by families, such as the library and recreation center. ✪

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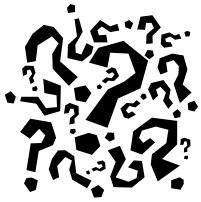

FAQs

regarding

Required Vaccines for the 2007-08 School Year

The following are frequently asked questions about the new Colorado Board of Health requirements for the 2007-08 school year.

Question: Why is PCV7 (Prevnar) administered to children and at what ages is this vaccination required in the childcare setting?

Answer: The PCV7 (Prevnar) vaccine is administered for the prevention of pneumococcal disease. PCV7 (Prevnar) is required for all children under two years of age in the childcare setting.

Question: When is the second dose of Varicella (Chickenpox) vaccine required?

Answer: The second dose of Varicella is required at kindergarten entry for the 2007-08 school year. Every year, a new grade will be added to the schedule. Example: For the 2008-09 school year, a second dose will be required in kindergarten and 1st grade; for the 2009-10 school year, a second dose will be required in kindergarten, 1st grade, and 2nd grade.

Question: Is documentation of the Chickenpox disease now required to be from a healthcare provider?

Answer: It will now be required that reporting of Chickenpox disease be documented by a healthcare provider. For all children who have a parent-reported case of Chickenpox disease noted prior to the 2007-08 school year on their current Certificate of Immunization, that documentation will be accepted. All children new to the Colorado school system and all children who have Chickenpox disease that has not been recorded on the Certificate of Immunization prior to the 2007-08 school year must now have documentation by a healthcare provider or laboratory confirmation showing immunity to the disease.

Question: What is considered acceptable documentation of a history of Chickenpox disease?

Answer: A copy of any notation by a healthcare provider is acceptable. This notation may be a copy of the child's medical record, on a prescription or other note pad, or an alternate format that is from the provider's office.

Question: Who is considered the child's healthcare provider when documenting a history of Chickenpox disease?

Answer: The intent of the Board of Health requirement is to implement the national recommendations of the Advisory Committee on Immunization Practices consistently. The goal is to have all suspected cases of Varicella in children documented by a healthcare provider. In most communities, the child's healthcare provider will be his/her primary care provider. We support children having a medical home, and the documentation of the child's medical conditions (including a history of Varicella disease) should be included in the medical record at his/her medical home. Healthcare providers who are not the child's primary care provider should encourage the parent to utilize the medical home model by encouraging parents to contact the child's primary care provider to document a history of Varicella disease in the child's medical record. It is important not to develop "silo medical records" – or records that are not incorporated within the child's primary care provider's records. In addition, the diagnosis and documentation of disease is within the scope of practice for physicians and advanced practice nurses. The diagnosis of disease by other healthcare providers may be outside of their scope of practice.

Question: For what grades is the Tdap (Tetanus, Diphtheria, Pertussis) vaccine required for the 2007-08 school year?

Answer: For the 2007-08 school year, Tdap will be required for all incoming 6th and 10th graders. This required vaccine will be implemented further on an integrated schedule. Example: For the 2008-09 school year, Tdap will be required for all incoming 6th, 7th, 10th, and 11th graders; for the 2009-10 school year, it will be required for all 6th, 7th, 8th, 10th, 11th, and 12th graders; for the 2010-2011 school years, it will be required for all 6th through 12th graders.

Question: If a child entering the 6th or 10th grade in the 2007-08 school year has just recently had a Td (Tetanus/Diphtheria) vaccination, should they get a Tdap vaccination right away?

Answer: No. There must be at least two years between a Td vaccination and a Tdap vaccination. Tdap affords the adolescent protection against Pertussis. It is important for adolescents to have this protection. Once the minimum interval has elapsed, the student should get a Tdap vaccination.

Question: How soon after a child has a Td vaccination will a Tdap vaccination be required?

Answer: A Tdap vaccination will be required two years after a Td vaccination is administered. Adolescents who have not had a Tdap vaccine are not protected against Pertussis. It is important for adolescents to have this protection. See the following publication for detailed information on Td, Tdap, and the required minimum intervals:

http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm?s_cid=rr5517a1_e

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As more questions arise about the new vaccine requirements, please feel free to contact Jamie Damico, RN, MSN, public health nurse consultant, at jamie.damico@state.co.us or 303-692-2957.

ASK *the* EXPERTS

The column in The ITAT Sharp Shooter *newsletter that allows you to get your questions answered by the professionals. We hope it's content will be both informative and helpful.*

Q ***Why are vaccines generally not given to infants under 6 weeks of age in the U.S.?***

A Mainly because little safety or efficacy data exist on doses given before 6 weeks of age, and the vaccines aren't licensed for this use. The data that exist suggest that the response to doses given before 6 weeks is poor; the response to hepatitis B vaccine is the exception.

Answered by Immunize.org

Q ***What does "simultaneous administration of vaccines" mean? Does it mean the same day, hour, or what?***

A Simultaneous means the same day-the same clinic day. If someone receives a vaccine in the morning and then another that same afternoon, it would be considered simultaneous administration.

Answered by Immunize.org

Q ***When a 3 month-old infant presents having had no prior immunizations, would you start the accelerated schedule?***

A The accelerated schedule should be used when the child is more than a month behind schedule, until you get them caught up. You can give the child the first set of recommended vaccines at age 3 months and then bring him back at age 4 months and give the second set of vaccinations. At this point the child will be caught up and can return to the usual schedule. As long as you observe the minimum intervals between doses and minimum ages for specific vaccines, this is fine to do. Once you have them back on schedule, stick with the recommended ages and intervals on the recommended childhood schedule. It is also important to educate the parents and talk to them about the importance of bringing the child in on time.

Answered by Immunize.org

Q ***If two live virus vaccines are inadvertently given less than 4 weeks apart, what should be done?***

A If two live virus vaccines are administered less than 4 weeks apart and not on the same day, the vaccine given second should be considered invalid and repeated. The repeat dose should be administered at least 4 weeks after the invalid dose. Alternatively, one can perform serologic testing to check for immunity, but this option may be more costly.

Answered by Immunize.org

Q ***Do persons who received chemotherapy need their vaccines repeated?***

A Vaccines received before starting chemotherapy do not need to be repeated after chemotherapy is completed. Chemotherapy does not negate vaccine-induced immunity. However, revaccination is recommended for persons who are recipients of a hematopoietic stem cell transplant (HSCT), such as a bone marrow transplant, because immunity present before the transplant is lost and may not be replaced by donor cells.

Answered by Immunize.org

Q ***Can vaccinations be given without a physician's order?***

A Vaccines must always be dispensed with a prescription or order from a physician or other healthcare provider authorized by the state to prescribe medications. However, there are situations where vaccines can be administered using authorized and signed standing orders. In these situations, the physician or other healthcare provider does not need to be physically present for the vaccine to be administered. Several studies have shown that the use of standing orders can improve vaccination rates, and ACIP recommends the use of standing orders programs in both outpatient and inpatient settings. A comprehensive set of standing orders for most all vaccines given to children and adults can be found at:

http://www.immunize.org/standingorders

Answered by Immunize.org ✪

Feature Articles

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- Colorado Immunization Information System (CIIS)
- Documentation of the Hepatitis B Birth Dose
- Documentation in Child Care Centers
- *Sharp Shooter* Marksman Corner
- FAQs for the 2007–08 School Year
- ASK the EXPERTS

This Summer edition of *The ITAT Sharp Shooter* also includes important phone numbers and websites listed throughout.

For questions or information about this *Sharp Shooter* Newsletter and/or the ITAT workgroup, please contact Teri Lindsey, Colorado Department of Public Health and Environment Immunization Program at (303) 692-2732 or Teri.Lindsey@state.co.us.

The ITAT sharp shooter

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2007 Summary of ACIP/AAP/AAFP Recommended Immunization Schedule for Ages 0–6 Years

Colorado Department of Public Health and Environment/Colorado Clinical Guidelines Collaborative

Current as of January 1, 2007. For updated information on new pediatric vaccines, visit the CCGC website at www.coloradoguidelines.org or the CDPHE website at www.cdphe.state.co.us/dc/immunization.

Vaccine ▼ Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B[1]	HepB	HepB		*See footnote 1*	HepB				HepB Series		
Rotavirus[2]			Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP		DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	*Hib*[4]	Hib		Hib			
Pneumococcal[5]			PCV	PCV	PCV	PCV				PCV / PPV	
Inactivated Poliovirus			IPV	IPV	IPV						IPV
Influenza[6]					Influenza (Yearly)						
Measles, Mumps, Rubella[7]						MMR					MMR
Varicella[8]						Varicella					Varicella
Hepatitis A[9]						HepA (2 doses)				HepA Series	
Meningococcal[10]										MPSV4	

Range of recommended ages

Catch-up immunization

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 0–6 years. Additional information is available at **http://www.cdc.gov/nip/recs/child-schedule.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 if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective Advisory Committee on Immunization Practices statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at **http://www.vaers.hhs.gov** or by telephone, 800-822-7967.

Footnotes

1. **Hepatitis B vaccine (HepB).** *(Minimum age: birth)*
   At birth:
   - Administer monovalent HepB to all newborns before hospital discharge.
   - If mother is hepatitis surface antigen (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 HBsAg-positive, administer HBIG (no later than age 1 week).
   - If mother is HBsAg-negative, the birth dose can only be delayed with physician's order and mothers' negative HBsAg laboratory report documented in the infant's medical record.

   After the birth dose:
   - The HepB series should be completed with either monovalent HepB or a combination vaccine containing HepB. The second dose should be administered at age 1–2 months. The final dose should be administered at age ≥24 weeks. Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg after completion of ≥3 doses of a licensed HepB series, at age 9–18 months (generally at the next well-child visit).

   4-month dose:
   - It is permissible to administer 4 doses of HepB when combination vaccines are administered after the birth dose. If monovalent HepB is used for doses after the birth dose, a dose at age 4 months is not needed.
2. **Rotavirus vaccine (Rota).** *(Minimum age: 6 weeks)*
   - Administer the first dose at age 6–12 weeks. Do not start the series later than age 12 weeks.
   - Administer the final dose in the series by age 32 weeks. Do not administer a dose later than age 32 weeks.
   - Data on safety and efficacy outside of these age ranges are insufficient.
3. **Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).** *(Minimum age: 6 weeks)*
   - The fourth dose of DTaP may be administered as early as age 12 months, 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® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required.
   - TriHiBit® (DTaP/Hib) combination products should not be used for primary immunization but can be used as boosters following any Hib vaccine in children aged ≥12 months.
5. **Pneumococcal vaccine.** *(Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPV])*
   - Administer PCV at ages 24–59 months in certain high-risk groups. Administer PPV to children aged ≥2 years in certain high-risk groups. See *MMWR* 2000;49(No. RR-9):1–35.
6. **Influenza vaccine.** *(Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 5 years for live, attenuated influenza vaccine [LAIV])*
   - All children aged 6–59 months and close contacts of all children aged 0–59 months are recommended to receive influenza vaccine.
   - Influenza vaccine is recommended annually for children aged ≥59 months with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at high risk. See *MMWR* 2006;55(No. RR-10):1–41.
   - For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
   - Children receiving TIV should receive 0.25 mL if aged 6–35 months or 0.5 mL if aged ≥3 years.
   - Children aged <9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).
7. **Measles, mumps, and rubella vaccine (MMR).** *(Minimum age: 12 months)*
   - Administer the second dose of MMR at age 4–6 years. MMR may be administered before age 4–6 years, provided ≥4 weeks 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 varicella vaccine at age 4–6 years. Varicella vaccine may be administered before age 4–6 years, provided that ≥3 months have elapsed since the first dose and both doses are administered at age ≥12 months. If second dose was administered ≥28 days following the first dose, the second dose does not need to be repeated.
9. **Hepatitis A vaccine (HepA).** *(Minimum age: 12 months)*
   - HepA is recommended for all children aged 1 year (i.e., aged 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 certain other groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.
10. **Meningococcal polysaccharide vaccine (MPSV4).** *(Minimum age: 2 years)*
    - Administer MPSV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. See *MMWR* 2005;54(No. RR-7):1–21.

ACIP-RC Rev 2/07

Catch-up immunization schedule for persons aged 4 months–6 years who start late or who are ≥1 month behind

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses.

Vaccine	Minimum age for Dose 1	Minimum interval between doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B[1]	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Rotavirus[2]	6 weeks	4 weeks	4 weeks		
Diphtheria, Tetanus, Pertussis[3]	6 weeks	4 weeks	4 weeks	6 months	6 months[3]
Haemophilus influenzae type b[4]	6 weeks	4 weeks if first dose administered at age <12 months; 8 weeks (as final dose) if first dose administered at age 12–14 months; No further doses needed if first dose administered at age ≥15 months	4 weeks[4] if current age <12 months; 8 weeks (as final dose)[4] if current age ≥12 months and second dose administered at age <15 months; No further doses needed if previous dose administered at age ≥15 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Pneumococcal[5]	6 weeks	4 weeks if first dose administered at age <12 months and current age <24 months; 8 weeks (as final dose) if first dose administered at age ≥12 months or current age 24–59 months; No further doses needed for healthy children if first dose administered at age ≥24 months	4 weeks if current age <12 months; 8 weeks (as final dose) if current age ≥12 months; No further doses needed for healthy children if previous dose administered at age ≥24 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Inactivated Poliovirus[6]	6 weeks	4 weeks	4 weeks	4 weeks[6]	
Measles, Mumps, Rubella[7]	12 months	4 weeks			
Varicella[8]	12 months	3 months			
Hepatitis A[9]	12 months	6 months			

Footnotes

1. **Hepatitis B vaccine (HepB).** *(Minimum age: birth)*
   - Administer the 3-dose series to those who were not previously vaccinated.
   - A 2-dose series of Recombivax HB® is licensed for children aged 11–15 years.
2. **Rotavirus vaccine (Rota).** *(Minimum age: 6 weeks)*
   - Do not start the series later than age 12 weeks.
   - Administer the final dose in the series by age 32 weeks. Do not administer a dose later than age 32 weeks.
   - Data on safety and efficacy outside of these age ranges are insufficient.
3. **Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).** *(Minimum age: 6 weeks)*
   - The fifth dose is not necessary if the fourth dose was administered at age ≥4 years.
   - DTaP is not indicated for persons aged ≥7 years.
4. **Haemophilus influenzae type b conjugate vaccine (Hib).** *(Minimum age: 6 weeks)*
   - Vaccine is not generally recommended for children aged ≥5 years.
   - If current age <12 months and the first 2 doses were PRP-OMP (PedvaxHIB® or ComVax® [Merck]), the third (and final) dose should be administered at age 12–15 months and at least 8 weeks after the second dose.
   - If first dose was administered at age 7–11 months, administer 2 doses separated by 4 weeks plus a booster at age 12–15 months.
5. **Pneumococcal conjugate vaccine (PCV).** *(Minimum age: 6 weeks)*
   - Vaccine is not generally recommended for children aged ≥5 years.
6. **Inactivated poliovirus vaccine (IPV).** *(Minimum age: 6 weeks)*
   - For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age ≥4 years.
   - If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
7. **Measles, mumps, and rubella vaccine (MMR).** *(Minimum age: 12 months)*
   - The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
   - If not previously vaccinated, administer 2 doses of MMR during any visit with ≥4 weeks between the doses.
8. **Varicella vaccine.** *(Minimum age: 12 months)*
   - The second dose of varicella vaccine is recommended routinely at age 4–6 years but may be administered earlier if desired.
   - Do not repeat the second dose in persons aged <13 years if administered ≥28 days after the first dose.
9. **Hepatitis A vaccine (HepA).** *(Minimum age: 12 months)*
   - HepA is recommended for certain groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.

2007 Summary of ACIP/AAP/AAFP Recommended Immunization Schedule for Ages 7–18 Years

Colorado Department of Public Health and Environment/Colorado Clinical Guidelines Collaborative

Current as of January 1, 2007. For updated information on new pediatric vaccines, visit the CCGC website at www.coloradoguidelines.org or the CDPHE website at www.cdphe.state.co.us/dc/immunization.

Vaccine ▼ Age ►	7–10 years	11–12 YEARS	13–14 years	15 years	16–18 years
Diphtheria, Tetanus, Pertussis[1]	*See footnote 1*	Tdap	Tdap		
Human Papillomavirus[2]	*See footnote 2*	HPV (3 doses)	HPV Series		
Meningococcal[3]	MPSV4	MCV4	MCV4	MCV4[3] MCV4	
Pneumococcal[4]	PPV				
Influenza[5]	Influenza (Yearly)				
Hepatitis A[6]	HepA Series				
Hepatitis B[7]	HepB Series				
Inactivated Poliovirus[8]	IPV Series				
Measles, Mumps, Rubella[9]	MMR Series				
Varicella[10]	Varicella Series				

Range of recommended ages

Catch-up immunization

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 7–18 years. Additional information is available at **http://www.cdc.gov/nip/recs/child-schedule.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 if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective Advisory Committee on Immunization Practices statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at **http://www.vaers.hhs.gov** or by telephone, 800-822-7967.

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/DTaP vaccination series and have not received a tetanus and diphtheria toxoids vaccine (Td) booster dose.
   - Adolescents aged 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/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 females 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 (at approximately age 15 years).
   - 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* 2005;54(No. RR-7):1–21. Use MPSV4 for children aged 2–10 years and MCV4 or MPSV4 for older children.
4. **Pneumococcal polysaccharide vaccine (PPV).** *(Minimum age: 2 years)*
   - Administer for certain high-risk groups. See *MMWR* 1997;46(No. RR-8):1–24, and *MMWR* 2000;49(No. RR-9):1–35.
5. **Influenza vaccine.** *(Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 5 years for live, attenuated influenza vaccine [LAIV])*
   - Influenza vaccine is recommended annually for persons with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at high risk. See *MMWR* 2006;55 (No. RR-10):1–41.
   - For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
   - Children aged <9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).
6. **Hepatitis A vaccine (HepA).** *(Minimum age: 12 months)*
   - The 2 doses in the series should be administered at least 6 months apart.
   - HepA is recommended for certain other groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55 (No. RR-7):1–23.
7. **Hepatitis B vaccine (HepB).** *(Minimum age: birth)*
   - Administer the 3-dose series to those who were not previously vaccinated.
   - A 2-dose series of Recombivax HB® is licensed for children aged 11–15 years.
8. **Inactivated poliovirus vaccine (IPV).** *(Minimum age: 6 weeks)*
   - For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if the third dose was administered at age ≥4 years.
   - If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
9. **Measles, mumps, and rubella vaccine (MMR).** *(Minimum age: 12 months)*
   - If not previously vaccinated, administer 2 doses of MMR during any visit, with ≥4 weeks between the doses.
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 after the first dose.
    - Administer 2 doses of varicella vaccine to persons aged ≥13 years at least 4 weeks apart.

Catch-up immunization schedule for persons aged 7–18 years who start late or who are ≥1 month behind

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses.

Vaccine	Minimum age for Dose 1	Minimum interval between doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Tetanus, Diphtheria/Tetanus, Diphtheria, Pertussis[1]	7 years[1]	4 weeks	**8 weeks** if first dose administered at age <12 months **6 months** if first dose administered at age ≥12 months	**6 months** if first dose administered at age <12 months	
Human Papillomavirus[2]	9 years	4 weeks	12 weeks		
Hepatitis A[3]	12 months	6 months			
Hepatitis B[4]	Birth	4 weeks	**8 weeks** (and 16 weeks after first dose)		
Inactivated Poliovirus[5]	6 weeks	4 weeks	4 weeks	4 weeks[5]	
Measles, Mumps, Rubella[6]	12 months	4 weeks			
Varicella[7]	12 months	**4 weeks** if first dose administered at age ≥13 years **3 months** if first dose administered at age <13 years			

Footnotes

1. **Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).** *(Minimum ages: 7 years for Td, 10 years for BOOSTRIX®, and 11 years for ADACEL™)*
   - Tdap should be substituted for a single dose of Td in the primary catch-up series or as a booster if age appropriate; use Td for other doses.
   - A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose. A booster (fourth) dose is needed if any of the previous doses were administered at age <12 months. Refer to ACIP recommendations for further information. See *MMWR* 2006;55(No. RR-3).
2. **Human papillomavirus vaccine (HPV).** *(Minimum age: 9 years)*
   - Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.
3. **Hepatitis A vaccine (HepA).** *(Minimum age: 12 months)*
   - HepA is recommended for certain groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.
4. **Hepatitis B vaccine (HepB).** *(Minimum age: birth)*
   - Administer the 3-dose series to those who were not previously vaccinated.
   - A 2-dose series of Recombivax HB® is licensed for children aged 11–15 years.
5. **Inactivated poliovirus vaccine (IPV).** *(Minimum age: 6 weeks)*
   - For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age ≥4 years.
   - If both OPV and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
6. **Measles, mumps, and rubella vaccine (MMR).** *(Minimum age: 12 months)*
   - The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
   - If not previously vaccinated, administer 2 doses of MMR during any visit with ≥4 weeks between the doses.
7. **Varicella vaccine.** *(Minimum age: 12 months)*
   - The second dose of varicella vaccine is recommended routinely at age 4–6 years but may be administered earlier if desired.
   - Do not repeat the second dose in persons aged <13 years if administered ≥28 days after the first dose.

Immunization Program Resources

Colorado Department of Public Health and Environment

General Immunization Questions: (303) 692-2650
Vaccine Orders: (303) 692-2796
Vaccines for Children (VFC) Program: (303) 692-2798
Hepatitis B Project: (303) 692-2673
Disease Reports: 1-800-866-2759
Vaccine Adverse Event Reporting System (VAERS): (303) 692-2732, 1-800-822-7967. Clinically significant adverse events that follow immunization should be reported to VAERS. Guidance about how to obtain and complete a VAERS form is also available at **http://www.vaers.hhs.gov**.
Vaccine Information Statements (VISs): http://www.cdc.gov/nip/publications/vis
Family Healthline (Parent Information): (303) 692-2229 (Denver metro area) or 1-800-688-7777
CDC Information Contact Center (for immunization questions): 1-800-CDC-INFO (1-800-232-4636); **NIPINFO@cdc.gov**

COLORADO CLINICAL GUIDELINES COLLABORATIVE

Background

The Colorado Clinical Guidelines Collaborative was formed in 1996 to address the challenges for the use and implementation of clinical guidelines across health care systems in Colorado. Current membership represents 50 health care organizations.

Mission Statement

CCGC is a Colorado coalition of healthcare stakeholders (health plans, physicians, hospitals, employers, government agencies, quality improvement organizations and other entities) working collaboratively to implement systems and processes, using evidenced-based clinical guidelines to improve healthcare outcomes in Colorado.

The Recommended Immunization Schedules for Persons Aged 0–18 Years are approved by the Advisory Committee on Immunization Practices (**http://www.cdc.gov/nip/acip**), the American Academy of Pediatrics (**http://www.aap.org**), and the American Academy of Family Physicians (**http://www.aafp.org**).

October 2006–September 2007 Summary of ACIP/ACOG/AAFP Adult Immunization Recommendations

Colorado Department of Public Health and Environment/Colorado Clinical Guidelines Collaborative

Recommended Adult Immunization Schedule, by Vaccine and Age Group

Vaccine ▼ / Age group ▶	19–49 years	50–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap)[1]*	1-dose Td booster every 10 yrs Substitute 1 dose of Tdap for Td		
Human papillomavirus (HPV)[2]*	3doses (females)		
Measles, mumps, rubella (MMR)[3]*	1 or 2 doses	1 dose	
Varicella[4]*	2 doses (0, 4–8 wks)	2 doses (0, 4–8 wks)	
Influenza[5]*	1 dose annually	1 dose annually	
Pneumococcal (polysaccharide)[6,7]	1–2 doses		1 dose
Hepatitis A[8]*	2 doses (0, 6–12 mos, or 0, 6–18 mos)		
Hepatitis B[9]*	3 doses (0, 1–2, 4–6 mos)		
Meningococcal[10]	1 or more doses		

This schedule indicates the recommended age groups and medical indications for routine administration of currently licensed vaccines for persons aged ≥19 years, as of October 1, 2006. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (http://www.cdc.gov/nip/publications/acip-list.htm).

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at http://www.vaers.hhs.gov or by telephone, (303) 692-2732 or 1-800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at http://www.hrsa.gov/vaccinecompensation or by telephone, 1-800-338-2382.To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule and contraindications for vaccination is also available at http://www.cdc.gov/nip or from the CDC-INFO Contact Center at 1-800-CDC-INFO (1-800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Recommended Adult Immunization Schedule, by Vaccine and Medical and Other Indications

Indication ▶ / Vaccine ▼	Pregnancy	Congenital immunodeficiency; leukemia;[11] lymphoma; generalized malignancy; cerebrospinal fluid leaks; therapy with alkylating agents, antimetabolites, radiation, or high-dose, long-term corticosteroids	Diabetes; heart disease; chronic pulmonary disease; chronic alcoholism	Asplenia[11] (including elective splenectomy and terminal complement component deficiencies)	Chronic liver disease; recipients of clotting factor concentrates	Kidney failure, end-stage renal disease, recipients of hemodialysis	Human immunodeficiency virus (HIV) infection[3,11]	Healthcare workers
Tetanus, diphtheria, pertussis (Td/Tdap)[1]*	1-dose Td booster every 10 yrs Substitute 1 dose of Tdap for Td							
Human papillomavirus (HPV)[2]*		3 doses for women through age 26 years (0, 2, 6 mos)						
Measles, mumps, rubella (MMR)[3]*			1 or 2 doses					
Varicella[4]*			2 doses (0, 4–8 wks)					2 doses
Influenza[5]*	1 dose annually			1 dose annually	1 dose annually			
Pneumococcal (polysaccharide)[6,7]	1–2 doses	1–2 doses						1–2 doses
Hepatitis A[8]*	2 doses (0, 6–12 mos, or 0, 6–18 mos)				2 doses (0, 6–12 mos, or 0, 6–18 mos)			
Hepatitis B[9]*	3 doses (0,1–2, 4–6 mos)				3 doses (0,1–2, 4–6 mos)			
Meningococcal[10]	1 dose			1 dose	1 dose			

NOTE: These schedules must be read along with the footnotes. *Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Contraindicated

For updates on vaccines, visit the CCGC website at www.coloradoguidelines.org or the CDPHE website at www.cdphe.state.co.us/dc/immunization.

October 2006–September 2007

RAIS-RC Rev 2/07

FOOTNOTES

1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination. Adults with uncertain histories of a complete primary vaccination series with diphtheria and tetanus toxoid–containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second. Administer a booster dose to adults who have completed a primary series and if the last vaccination was received ≥10 years previously. Tdap or tetanus and diphtheria (Td) vaccine may be used; Tdap should replace a single dose of Td for adults aged <65 years who have not previously received a dose of Tdap (either in the primary series, as a booster, or for wound management). Only one of two Tdap products (Adacel® [sanofi pasteur, Swiftwater, Pennsylvania]) is licensed for use in adults. If the person is pregnant and received the last Td vaccination ≥10 years previously, administer Td during the second or third trimester; if the person received the last Td vaccination in <10 years, administer Tdap during the immediate postpartum period. A onetime administration of 1-dose of Tdap with an interval as short as 2 years from a previous Td vaccination is recommended for postpartum women, close contacts of infants aged <12 months, and all health-care workers with direct patient contact. In certain situations, Td can be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be given instead of Td to a pregnant woman after an informed discussion with the woman (see http://www.cdc.gov/nip/publications/acip-list.htm). Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management (http://www.cdc.gov/mmwr/preview/mmwrhtml/ 00041645.htm).

2. Human Papillomavirus (HPV) vaccination. HPV vaccination is recommended for all women aged ≤26 years who have not completed the vaccine series. Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, women who are sexually active should still be vaccinated. Sexually active women who have not been infected with any of the HPV vaccine types receive the full benefit of the vaccination. Vaccination is less beneficial for women who have already been infected with one or more of the four HPV vaccine types. A complete series consists of 3 doses. The second dose should be administered 2 months after the first dose; the third dose should be administered 6 months after the first dose. Vaccination is not recommended during pregnancy. If a woman is found to be pregnant after initiating the vaccination series, the remainder of the 3dose regimen should be delayed until after completion of the pregnancy.

3. Measles, Mumps, Rubella (MMR) vaccination. *Measles component:* adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥1 dose of MMR unless they have a medical contraindication, documentation of ≥1 dose, history of measles based on health-care provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) have been recently exposed to measles or in an outbreak setting; 2) were previously vaccinated with killed measles vaccine; 3) have been vaccinated with an unknown type of measles vaccine during 1963–1967; 4) are students in postsecondary educational institutions; 5) work in a health-care facility, or 6) plan to travel internationally. Withhold MMR or other measles-containing vaccines from HIV-infected persons with severe immunosuppression. *Mumps component:* adults born before 1957 can generally be considered immune to mumps. Adults born during or after 1957 should receive 1 dose of MMR unless they have a medical contraindication, history of mumps based on health-care provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) are in an age group that is affected during a mumps outbreak; 2) are students in postsecondary educational institutions; 3) work in a health-care facility; or 4) plan to travel internationally. For unvaccinated health-care workers born before 1957 who do not have other evidence of mumps immunity, consider giving 1 dose on a routine basis and strongly consider giving a second dose during an outbreak. *Rubella component:* administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Do not vaccinate women who are pregnant or who might become pregnant within 4 weeks of receiving vaccine. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

4. Varicella vaccination. All adults without evidence of immunity to varicella should receive 2 doses of varicella vaccine. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., health-care workers and family contacts of immunocompromised persons) or 2) are at high risk for exposure or transmission (e.g., teachers of young children; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers). Evidence of immunity to varicella in adults includes any of the following: 1) documentation of 2 doses of varicella vaccine at least 4 weeks apart; 2) U.S.–born before 1980 (although for health-care workers and pregnant women, birth before 1980 should not be considered evidence of immunity); 3) history of varicella based on diagnosis or verification of varicella by a health-care provider (for a patient reporting a history of or presenting with an atypical case, a mild case, or both, health-care providers should seek either an epidemiologic link with a typical varicella case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on health-care provider diagnosis; or 5) laboratory evidence of immunity or laboratory confirmation of disease. Do not vaccinate women who are pregnant or might become pregnant within 4 weeks of receiving the vaccine. Assess pregnant women for evidence of varicella immunity. Women who do not have evidence of immunity should receive dose 1 of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. Dose 2 should be administered 4–8 weeks after dose 1.

5. Influenza vaccination: *Medical indications:* chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or HIV); any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, or seizure disorder or other neuromuscular disorder); and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia. *Occupational indications:* health-care workers and employees of long-term–care and assisted living facilities. *Other indications:* residents of nursing homes and other long-term–care and assisted living facilities; persons likely to transmit influenza to persons at high risk (i.e., in-home household contacts and caregivers of children aged 0–59 months, or persons of all ages with high-risk conditions); and anyone who would like to be vaccinated. Healthy, nonpregnant persons aged 5–49 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special care units can receive either intranasally administered influenza vaccine (FluMist®) or inactivated vaccine. Other persons should receive the inactivated vaccine.

6. Pneumococcal polysaccharide vaccination. *Medical indications:* chronic disorders of the pulmonary system (excluding asthma); cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g.,cirrhosis); chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection [vaccinate as close to diagnosis as possible when CD4 cell counts are highest], leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, organ or bone marrow transplantation); chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids; and cochlear implants. *Other indications:* Alaska Natives and certain American Indian populations and residents of nursing homes or other long-term–care facilities.

7. Revaccination with pneumococcal polysaccharide vaccine. One-time revaccination after 5 years for persons with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection, leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); or chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids. For persons aged ≥65 years, one-time revaccination if they were vaccinated ≥5 years previously and were aged <65 years at the time of primary vaccination.

8. Hepatitis A vaccination. *Medical indications:* persons with chronic liver disease and persons who receive clotting factor concentrates. *Behavioral indications:* men who have sex with men and persons who use illegal drugs. *Occupational indications:* persons working with hepatitis A virus (HAV)–infected primates or with HAV in a research laboratory setting. *Other indications:* persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at http://www.cdc.gov/travel/diseases.htm) and any person who would like to obtain immunity. Current vaccines should be administered in a 2-dose schedule at either 0 and 6–12 months, or 0 and 6–18 months. If the combined hepatitis A and hepatitis B vaccine is used, administer 3 doses at 0, 1, and 6 months.

9. Hepatitis B vaccination. *Medical indications:* Persons with end-stage renal disease, including patients receiving hemodialysis; persons seeking evaluation or treatment for a sexually transmitted disease (STD); persons with HIV infection; persons with chronic liver disease; and persons who receive clotting factor concentrates. *Occupational indications:* health-care workers and public-safety workers who are exposed to blood or other potentially infectious body fluids. *Behavioral indications*: sexually active persons who are not in a long-term, mutually monogamous relationship (i.e., persons with >1 sex partner during the previous 6 months); current or recent injection-drug users; and men who have sex with men. *Other indications:* household contacts and sex partners of persons with chronic hepatitis B virus (HBV) infection; clients and staff members of institutions for persons with developmental disabilities; all clients of STD clinics; international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at http:// www.cdc.gov/travel/diseases.htm); and any adult seeking protection from HBV infection. Settings where hepatitis B vaccination is recommended for all adults: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings providing services for injection-drug users or men who have sex with men; correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities. *Special formulation indications:* for adult patients receiving hemodialysis and other immunocompromised adults, 1 dose of 40 µg/mL (Recombivax HB®) or 2 doses of 20 µg/mL (Engerix-B®).

10. Meningococcal vaccination. *Medical indications:* adults with anatomic or functional asplenia, or terminal complement component deficiencies. *Other indications:* first-year college students living in dormitories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits; and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of Sub-Saharan Africa during the dry season [December–June]), particularly if contact with local populations will be prolonged. Vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj. Meningococcal conjugate vaccine is preferred for adults with any of the preceding indications who are aged ≤55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 5 years might be indicated for adults previously vaccinated with MPSV4 who remain at high risk for infection (e.g., persons residing in areas in which disease is epidemic).

11. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccination may be used. Hib conjugate vaccines are licensed for children aged 6 weeks–71 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or have had splenectomies; administering vaccine to these patients is not contraindicated.

Immunization Program Resources

Colorado Department of Public Health and Environment

General Immunization Questions: (303) 692-2332

Website: www.cdphe.state.co.us/dc/immunization

CIPAC Website: (with flu shot clinic listings) www.immunizecolorado.com

Hepatitis B Project: (303) 692-2673

Disease Reports: 1-800-866-2759

Vaccine Information Statements (VISs): www.cdc.gov/nip/publications/vis

Family Healthline: (303) 692-2229 (Denver metro) or 1-800-688-7777

CDC Information Contact Center (for immunization questions): 1-800-CDC-INFO (1-800-232-4636); NIPINFO@cdc.gov

COLORADO CLINICAL GUIDELINES COLLABORATIVE

Background

The Colorado Clinical Guidelines Collaborative was formed in 1996 to address the challenges for the use and implementation of clinical guidelines across health care systems in Colorado. Current membership represents 50 health care organizations.

Mission Statement

CCGC is a Colorado coalition of healthcare stakeholders (health plans, physicians, hospitals, employers, government agencies, quality improvement organizations and other entities) working collaboratively to implement systems and processes, using evidenced-based clinical guidelines to improve healthcare outcomes in Colorado.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Website: www.cdc.gov/nip

Approved by the Advisory Committee on Immunization Practices, the American College of Obstetricians and Gynecologists, and the American Academy of Family Physicians