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New Immunization Schedules for 2010

Last year, several new vaccines were licensed, including a bivalent HPV vaccine (Cervarix®) for females and a new Hib vaccine (Hiberix®) for the final dose in the Hib vaccine series. In addition, the Advisory Committee on Immunization Practices (ACIP) updated several vaccine recommendations. A new provisional recommendation permits the use of the quadrivalent HPV vaccine (Gardasil®) in males. And ACIP now recommends revaccinating children and adults who remain at increased risk for meningococcal disease. The updated recommendations are reflected in the 2010 immunization schedules for children, adolescents, and adults.

In January 2010, the Centers for Disease Control and Prevention (CDC) published both the Recommended Immunization Schedules for Persons Aged 0-18 years—United States, 2010, and the Recommended Adult Immunization Schedule—United States, 2010.

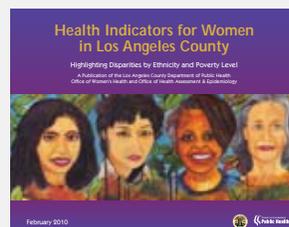
(Note: The schedules are featured on pages 3-7. Black-and-white versions are available at www.cdc.gov.)

Notable Childhood Immunization Schedule Changes

- **Use of combination vaccines:** The introductory paragraph updates ACIP recommendations for use of combination vaccines. ACIP states “the use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events.”
- **Inactivated Polio Vaccine (IPV):** The last dose in the IPV series should be administered on or after the fourth birthday and at least 6 months after the previous dose. In addition, if four doses are administered before age 4 years, an additional (fifth) dose should be administered at age 4 through 6 years.
- **Hepatitis A vaccine:** The footnotes have been revised to recommend

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New Report Finds Large Disparities in Women's Health in LA County



A new report released last month, “Health Indicators for Women in Los Angeles County: Highlighting Disparities by Ethnicity and Poverty Level,” presents strong evidence of the health inequities among women and the role that social determinants of health play in these inequities.

The report, compiled by the Department of Public Health’s Office of Women’s Health and Office of Health Assessment and Epidemiology, contains the latest data on health status, access to care, health behaviors, social and physical environment, and health outcomes for women in Los Angeles County by race/ethnicity and poverty level. Unique to this report, a special health topics section highlights data for women 65 years and older, uninsured women, women with disabilities, and lesbian and bisexual women.

Among the Report’s Findings:

- The influence of poverty level on the health of women is dramatic, with poorer

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NEW IMMUNIZATION SCHEDULES *from page 1*

vaccination of children older than 23 months for whom immunity against hepatitis A is desired. Vaccination of children who live in areas where vaccination programs target older children or who are at increased risk of infection continues to be recommended. (Note: California targets all children aged 12 months through 18 years to receive the hepatitis A vaccine series.)

- **Meningococcal conjugate vaccine (MCV4):** Revaccination with meningococcal conjugate vaccine is now recommended for children who remain at increased risk for meningococcal disease after 3 years (if the first dose was administered at age 2 through 6 years), or after 5 years (if the first dose was administered at age 7 years or older).
- **Human papillomavirus (HPV) vaccine:** The footnotes for HPV vaccine have been modified to include 1) the availability of and recommendations for bivalent HPV (HPV2) vaccine, and 2) a statement that quadrivalent HPV (HPV4) vaccine may be administered in a three-dose series to males aged 9 through 18 years to reduce the likelihood of acquiring genital warts.

Notable Adult Immunization Schedule Changes

- **HPV vaccine:** The HPV footnote states that a bivalent HPV vaccine (HPV2) has been licensed for use in females. Either HPV2 or HPV4 can be used for vaccination of females aged 19 through 26 years. In addition, the footnote indicates that HPV4 may be used in males aged 9 through 26 years to prevent genital warts.
- **Measles, Mumps, Rubella (MMR) vaccine:** There is clarification of which adults need one dose and which need a second dose of MMR vaccine for the measles and mumps components. If a second dose of MMR is indicated, it should be administered four weeks after the first dose. Women who do not have laboratory documentation of rubella immunity or documentation of vaccination should receive a dose of MMR. Finally, health care facilities should consider vaccinating unvaccinated health care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/

or rubella immunity or laboratory confirmation of disease, with two doses of MMR vaccine at the appropriate interval (for measles and mumps) and one dose of MMR vaccine (for rubella), respectively. During an outbreak of measles, mumps, or rubella, health care facilities should recommend that these unvaccinated health care personnel be immunized as described above.

- **Influenza vaccine:** The influenza footnote now distinguishes between seasonal and pandemic influenza by adding the term “seasonal.”
- **Hepatitis A vaccine:** Hepatitis A vaccine is indicated for unvaccinated persons who anticipate close contact with an international adoptee during the first 60 days after the adoptee’s arrival in the United States.
- **Hepatitis B vaccine:** The hepatitis B footnote has been revised to include schedule information for the three-dose hepatitis B vaccine. The second dose should be administered one month after the first dose; the third dose should be administered at least two months after the second dose (and at least four months after the first dose).
- **Meningococcal vaccine:** The meningococcal conjugate vaccine (MCV4) is preferred for adults aged 55 years or younger, and the meningococcal polysaccharide vaccine (MPSV4) is preferred for adults aged 56 years or older. Revaccination with MCV4 after five years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia). Persons whose only risk factor is living in on-campus housing do not need an additional dose.
- **Haemophilus influenzae Type b (Hib) vaccine:** The selected conditions for which Hib vaccine may be used have been revised. Studies suggest good immunogenicity of Hib vaccine in patients who have sickle cell disease, leukemia, or HIV infection, or who have had a splenectomy.

If you have questions about immunizations, contact the Immunization Program at (213) 351-7800. 

WOMEN'S HEALTH *from page 1*

health outcomes associated with decreasing poverty levels. For example, rates of diabetes and obesity are over two times higher among the poorest women compared with women living at greater than 300% of the federal poverty level.

- African American women have far higher mortality rates than other ethnic groups for chronic diseases such as coronary heart disease, stroke, diabetes, and breast cancer despite reporting better access to care and a higher self-rated health status. Emerging evidence indicates that factors such as racial inequality, discrimination, and stress are important contributors to health disparities among black women.
- Latinas report the poorest self-rated health status, and compared with all other groups, they report poorer access to care. Over one-third lack health insurance, and 40%

report difficulty accessing medical care. Latinas were found to have higher rates of obesity and diabetes compared to other ethnic groups and they had disproportionately higher death rates from diabetes (31 per 100,000), compared with all women (21 per 100,000).

- Asian/Pacific Islander women received low rates of recommended preventive services such as breast, cervical and colorectal cancer screening and pneumococcal vaccination. Given the heterogeneity of this population, far more health disparities would be apparent if individual ethnic groups within the larger population were examined.

The full report is available online at <http://publichealth.lacounty.gov/owh>. For a printed copy or questions about the report, contact Dr. Rita Singhal at (626) 569-3816 or rsinghal@ph.lacounty.gov. 

Recommended Immunization Schedule for Persons Aged 0 through 6 Years—UNITED STATES • 2010

For those who fall behind or start late, see the catch-up schedule

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			HepB						
Rotavirus ²				RV	RV	RV ²						
Diphtheria, Tetanus, Pertussis ³				DTaP	DTaP	DTaP	^{see footnote³}	DTaP				DTaP
<i>Haemophilus influenzae</i> type b ⁴				Hib	Hib	Hib ⁴		Hib				
Pneumococcal ⁵				PCV	PCV	PCV		PCV			PPSV	
Inactivated Poliovirus ⁶				IPV	IPV			IPV				IPV
Influenza ⁷							Influenza (Yearly)					
Measles, Mumps, Rubella ⁸							MMR		^{see footnote⁸}			MMR
Varicella ⁹							Varicella		^{see footnote⁹}			Varicella
Hepatitis A ¹⁰							HepA (2 doses)				HepA Series	
Meningococcal ¹¹												MCV

Range of recommended ages for all children except certain high-risk groups

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 15, 2009. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory

Committee on Immunization Practices statement for detailed recommendations: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

1. Hepatitis B vaccine (HepB). (Minimum age: birth)

At birth:

- Administer monovalent HepB to all newborns before hospital discharge.
- If mother is hepatitis B 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 mother's HBsAg status as soon as possible and, if HBsAg-positive, administer HBIG (no later than age 1 week).

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 or 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks. The final dose should be administered no earlier than age 24 weeks.
- Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg 1 to 2 months after completion of at least 3 doses of the HepB series, at age 9 through 18 months (generally at the next well-child visit).
- Administration of 4 doses of HepB to infants is permissible when a combination vaccine containing HepB is administered after the birth dose. The fourth dose should be administered no earlier than age 24 weeks.

2. Rotavirus vaccine (RV). (Minimum age: 6 weeks)

- Administer the first dose at age 6 through 14 weeks (maximum age: 14 weeks 6 days). Vaccination should not be initiated for infants aged 15 weeks 0 days or older.
- The maximum age for the final dose in the series is 8 months 0 days
- If Rotarix is administered at ages 2 and 4 months, a dose at 6 months is not indicated.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).

- (Minimum age: 6 weeks)
- The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- Administer the final dose in the series at age 4 through 6 years.

4. *Haemophilus influenzae* type b conjugate vaccine (Hib).

- (Minimum age: 6 weeks)
- If PRP-OMP (PedvaxHIB or Comvax [HepB-Hib]) is administered at ages 2 and 4 months, a dose at age 6 months is not indicated.
- TriHibit (DTaP/Hib) and Hiberix (PRP-T) should not be used for doses at ages 2, 4, or 6 months for the primary series but can be used as the final dose in children aged 12 months through 4 years.

5. Pneumococcal vaccine. (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPSV])

- PCV is recommended for all children aged younger than 5 years. Administer 1 dose of PCV to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
- Administer PPSV 2 or more months after last dose of PCV to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant. See *MMWR* 1997;46(No. RR-8).

6. Inactivated poliovirus vaccine (IPV) (Minimum age: 6 weeks)

- The final dose in the series should be administered on or after the fourth birthday and at least 6 months following the previous dose.
- If 4 doses are administered prior to age 4 years a fifth dose should be administered at age 4 through 6 years. See *MMWR* 2009;58(30):829–30.

7. Influenza vaccine (seasonal). (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 2 years for live, attenuated influenza vaccine [LAIV])

- Administer annually to children aged 6 months through 18 years.
- For healthy children aged 2 through 6 years (i.e., those who do not have underlying medical conditions that predispose them to influenza complications), either LAIV or TIV may be used, except LAIV should not be given to children aged 2 through 4 years who have had wheezing in the past 12 months.
- Children receiving TIV should receive 0.25 mL if aged 6 through 35 months or 0.5 mL if aged 3 years or older.
- Administer 2 doses (separated by at least 4 weeks) to children aged younger than 9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season but only received 1 dose.
- For recommendations for use of influenza A (H1N1) 2009 monovalent vaccine see *MMWR* 2009;58(No. RR-10).

8. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- Administer the second dose routinely at age 4 through 6 years. However, the second dose may be administered before age 4, provided at least 28 days have elapsed since the first dose.

9. Varicella vaccine. (Minimum age: 12 months)

- Administer the second dose routinely at age 4 through 6 years. However, the second dose may be administered before age 4, provided at least 3 months have elapsed since the first dose.
- For children aged 12 months through 12 years the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.

10. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- Administer to all children aged 1 year (i.e., aged 12 through 23 months). Administer 2 doses at least 6 months apart.
- Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits
- HepA also is recommended for older children who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A is desired.

11. Meningococcal vaccine. (Minimum age: 2 years for meningococcal conjugate vaccine [MCV4] and for meningococcal polysaccharide vaccine [MPSV4])

- Administer MCV4 to children aged 2 through 10 years with persistent complement component deficiency, anatomic or functional asplenia, and certain other conditions placing them at high risk.
- Administer MCV4 to children previously vaccinated with MCV4 or MPSV4 after 3 years if first dose administered at age 2 through 6 years. See *MMWR* 2009;58:1042–3.

Recommended Immunization Schedule for Persons Aged 7 through 18 Years—UNITED STATES • 2010

For those who fall behind or start late, see the schedule below and the catch-up schedule

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years
Tetanus, Diphtheria, Pertussis ¹			Tdap	Tdap
Human Papillomavirus ²		see footnote 2	HPV (3 doses)	HPV series
Meningococcal ³		MCV	MCV	MCV
Influenza ⁴		Influenza (Yearly)		
Pneumococcal ⁵		PPSV		
Hepatitis A ⁶		HepA Series		
Hepatitis B ⁷		Hep B Series		
Inactivated Poliovirus ⁸		IPV Series		
Measles, Mumps, Rubella ⁹		MMR Series		
Varicella ¹⁰		Varicella Series		

Range of recommended ages for all children except certain high-risk groups

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

This schedule includes recommendations in effect as of December 15, 2009. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Considerations should include provider assessment, patient preference, and the potential for adverse events. Providers should consult the relevant Advisory

Committee on Immunization Practices statement for detailed recommendations: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

- Tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).** (Minimum age: 10 years for Boostrix and 11 years for Adacel)
 - Administer at age 11 or 12 years for those who have completed the recommended childhood DTP/DTaP vaccination series and have not received a tetanus and diphtheria toxoid (Td) booster dose.
 - Persons aged 13 through 18 years who have not received Tdap should receive a dose.
 - A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose; however, a shorter interval may be used if pertussis immunity is needed.
- Human papillomavirus vaccine (HPV).** (Minimum age: 9 years)
 - Two HPV vaccines are licensed: a quadrivalent vaccine (HPV4) for the prevention of cervical, vaginal and vulvar cancers (in females) and genital warts (in females and males), and a bivalent vaccine (HPV2) for the prevention of cervical cancers in females.
 - HPV vaccines are most effective for both males and females when given before exposure to HPV through sexual contact.
 - HPV4 or HPV2 is recommended for the prevention of cervical precancers and cancers in females.
 - HPV4 is recommended for the prevention of cervical, vaginal and vulvar precancers and cancers and genital warts in females.
 - Administer the first dose to females at age 11 or 12 years.
 - Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
 - Administer the series to females at age 13 through 18 years if not previously vaccinated.
 - HPV4 may be administered in a 3-dose series to males aged 9 through 18 years to reduce their likelihood of acquiring genital warts.
- Meningococcal conjugate vaccine (MCV4).**
 - Administer at age 11 or 12 years, or at age 13 through 18 years if not previously vaccinated.
 - Administer to previously unvaccinated college freshmen living in a dormitory.
 - Administer MCV4 to children aged 2 through 10 years with persistent complement component deficiency, anatomic or functional asplenia, or certain other conditions placing them at high risk.
 - Administer to children previously vaccinated with MCV4 or MPSV4 who remain at increased risk after 3 years (if first dose administered at age 2 through 6 years) or after 5 years (if first dose administered at age 7 years or older). Persons whose only risk factor is living in on-campus housing are not recommended to receive an additional dose. See *MMWR* 2009;58:1042–3.

- Influenza vaccine (seasonal).**
 - Administer annually to children aged 6 months through 18 years.
 - For healthy nonpregnant persons aged 7 through 18 years (i.e., those who do not have underlying medical conditions that predispose them to influenza complications), either LAIV or TIV may be used.
 - Administer 2 doses (separated by at least 4 weeks) to children aged younger than 9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season but only received 1 dose.
 - For recommendations for use of influenza A (H1N1) 2009 monovalent vaccine. See *MMWR* 2009;58(No. RR-10).
- Pneumococcal polysaccharide vaccine (PPSV).**
 - Administer to children with certain underlying medical conditions, including a cochlear implant. A single revaccination should be administered after 5 years to children with functional or anatomic asplenia or an immunocompromising condition. See *MMWR* 1997;46(No. RR-8).
- Hepatitis A vaccine (HepA).**
 - Administer 2 doses at least 6 months apart.
 - HepA is recommended for children aged older than 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A is desired.
- Hepatitis B vaccine (HepB).**
 - Administer the 3-dose series to those not previously vaccinated.
 - A 2-dose series (separated by at least 4 months) of adult formulation Recombivax HB is licensed for children aged 11 through 15 years.
- Inactivated poliovirus vaccine (IPV).**
 - The final dose in the series should be administered on or after the fourth birthday and at least 6 months following the previous dose.
 - 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.
- Measles, mumps, and rubella vaccine (MMR).**
 - If not previously vaccinated, administer 2 doses or the second dose for those who have received only 1 dose, with at least 28 days between doses.
- Varicella vaccine.**
 - For persons aged 7 through 18 years without evidence of immunity (see *MMWR* 2007;56[No. RR-4]), administer 2 doses if not previously vaccinated or the second dose if only 1 dose has been administered.
 - For persons aged 7 through 12 years, the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.
 - For persons aged 13 years and older, the minimum interval between doses is 28 days.

The Recommended Immunization Schedules for Persons Aged 0 through 18 Years are approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/recs/acip>), the American Academy of Pediatrics (<http://www.aap.org>), and the American Academy of Family Physicians (<http://www.aafp.org>).
 Department of Health and Human Services • Centers for Disease Control and Prevention

Catch-up Immunization Schedule for Persons Aged 4 Months Through 18 Years Who Start Late or Who Are More Than 1 Month Behind—United States • 2010

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. Use the section appropriate for the child's age.

PERSONS AGED 4 MONTHS THROUGH 6 YEARS					
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 at least 16 weeks after first dose)		
Rotavirus ²	6 wks	4 weeks	4 weeks ²		
Diphtheria, Tetanus, Pertussis ³	6 wks	4 weeks	4 weeks	6 months	6 months ³
<i>Haemophilus influenzae</i> type b ⁴	6 wks	4 weeks if first dose administered at younger than 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 or older	4 weeks ⁴ if current age is younger than 12 months 8 weeks (as final dose) ⁴ if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than 15 months No further doses needed if previous dose administered at age 15 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	
Pneumococcal ⁵	6 wks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24 through 59 months No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for high-risk children who received 3 doses at any age	
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	6 months	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks	4 weeks		
Varicella ⁸	12 mos	3 months			
Hepatitis A ⁹	12 mos	6 months			
PERSONS AGED 7 THROUGH 18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis ¹⁰	7 yrs ¹⁰	4 weeks	4 weeks if first dose administered at younger than age 12 months 6 months if first dose administered at 12 months or older	6 months if first dose administered at younger than age 12 months	
Human Papillomavirus ¹¹	9 yrs	Routine dosing intervals are recommended ¹¹			
Hepatitis A ⁹	12 mos	6 months			
Hepatitis B ¹	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	6 months	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

1. Hepatitis B vaccine (HepB).

- Administer the 3-dose series to those not previously vaccinated.
- A 2-dose series (separated by at least 4 months) of adult formulation Recombivax HB is licensed for children aged 11 through 15 years.

2. Rotavirus vaccine (RV).

- The maximum age for the first dose is 14 weeks 6 days. Vaccination should not be initiated for infants aged 15 weeks 0 days or older.
- The maximum age for the final dose in the series is 8 months 0 days.
- If Rotarix was administered for the first and second doses, a third dose is not indicated.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).

- The fifth dose is not necessary if the fourth dose was administered at age 4 years or older.

4. *Haemophilus influenzae* type b conjugate vaccine (Hib).

- Hib vaccine is not generally recommended for persons aged 5 years or older. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults. However, studies suggest good immunogenicity in persons who have sickle cell disease, leukemia, or HIV infection, or who have had a splenectomy; administering 1 dose of Hib vaccine to these persons who have not previously received Hib vaccine is not contraindicated.
- If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax), and administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 months and at least 8 weeks after the second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a final dose at age 12 through 15 months.

5. Pneumococcal vaccine.

- Administer 1 dose of pneumococcal conjugate vaccine (PCV) to all healthy children aged 24 through 59 months who have not received at least 1 dose of PCV on or after age 12 months.
- For children aged 24 through 59 months with underlying medical conditions, administer 1 dose of PCV if 3 doses were received previously or administer 2 doses of PCV at least 8 weeks apart if fewer than 3 doses were received previously.
- Administer pneumococcal polysaccharide vaccine (PPSV) to children aged 2 years or older with certain underlying medical conditions, including a cochlear implant, at least 8 weeks after the last dose of PCV. See *MMWR* 1997;46(No. RR-8).

6. Inactivated poliovirus vaccine (IPV).

- The final dose in the series should be administered on or after the fourth birthday and at least 6 months following the previous dose.

- A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months following the previous dose.

- In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).

7. Measles, mumps, and rubella vaccine (MMR).

- Administer the second dose routinely at age 4 through 6 years. However, the second dose may be administered before age 4, provided at least 28 days have elapsed since the first dose.
- If not previously vaccinated, administer 2 doses with at least 28 days between doses.

8. Varicella vaccine.

- Administer the second dose routinely at age 4 through 6 years. However, the second dose may be administered before age 4, provided at least 3 months have elapsed since the first dose.
- For persons aged 12 months through 12 years, the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.
- For persons aged 13 years and older, the minimum interval between doses is 28 days.

9. Hepatitis A vaccine (HepA).

- HepA is recommended for children aged older than 23 months who live in areas where vaccination programs target older children, who are at increased risk for infection, or for whom immunity against hepatitis A is desired.

10. Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).

- Doses of DTaP are counted as part of the Td/Tdap series
- Tdap should be substituted for a single dose of Td in the catch-up series or as a booster for children aged 10 through 18 years; use Td for other doses.

11. Human papillomavirus vaccine (HPV).

- Administer the series to females at age 13 through 18 years if not previously vaccinated.
- Use recommended routine dosing intervals for series catch-up (i.e., the second and third doses should be administered at 1 to 2 and 6 months after the first dose). The minimum interval between the first and second doses is 4 weeks. The minimum interval between the second and third doses is 12 weeks, and the third dose should be administered at least 24 weeks after the first dose.

Information about reporting reactions after immunization is available online at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967. Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for immunization, is available from the National Center for Immunization and Respiratory Diseases at <http://www.cdc.gov/vaccines> or telephone, 800-CDC-INFO (800-232-4636).

Recommended Adult Immunization Schedule—UNITED STATES • 2010

Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group

VACCINE ▼	AGE GROUP ▶	19–26 years	27–49 years	50–59 years	60–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,2}		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs				Td booster every 10 yrs
Human papillomavirus (HPV) ^{2,3}		3 doses (females)				
Varicella ²		2 doses				
Zoster ²					1 dose	
Measles, mumps, rubella (MMR) ^{2,3}		1 or 2 doses		1 dose		
Influenza ²		1 dose annually				
Pneumococcal (polysaccharide) ^{2,3}		1 or 2 doses				1 dose
Hepatitis A ²		2 doses				
Hepatitis B ¹⁰		3 doses				
Meningococcal ¹¹		1 or more doses				

¹Covered 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) No recommendation

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 www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 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, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

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

Figure 2. Vaccines that might be indicated for adults based on medical and other indications

VACCINE ▼	INDICATION ▶	Pregnancy	Immuno-compromising conditions (excluding human immunodeficiency virus [HIV]) ^{1,2,13}	HIV infection ^{1,12,13}		Diabetes, heart disease, chronic lung disease, chronic alcoholism	Asplenia ¹⁴ (including elective splenectomy and persistent complement deficiencies)	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemodialysis	Health-care personnel	
				<200 cells/μL	≥200 cells/μL						
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,2}		Td	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs								
Human papillomavirus (HPV) ^{2,3}			3 doses for females through age 26 yrs								
Varicella ²		Contraindicated	2 doses								
Zoster ²		Contraindicated	1 dose								
Measles, mumps, rubella (MMR) ^{2,3}		Contraindicated	1 or 2 doses								
Influenza ²			1 dose TIV annually								1 dose TIV or LAIV annually
Pneumococcal (polysaccharide) ^{2,3}			1 or 2 doses								
Hepatitis A ²			2 doses								
Hepatitis B ¹⁰			3 doses								
Meningococcal ¹¹			1 or more doses								

¹Covered 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) No recommendation

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of January 1, 2010. 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 (www.cdc.gov/vaccines/pubs/acip-list.htm).

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Obstetricians and Gynecologists (ACOG), and the American College of Physicians (ACP).



Footnotes

Recommended Adult Immunization Schedule—UNITED STATES • 2010

For complete statements by the Advisory Committee on Immunization Practices (ACIP), visit www.cdc.gov/vaccines/pubs/ACIP-list.htm

1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination

Tdap should replace a single dose of Td for adults aged 19 through 64 years who have not received a dose of Tdap previously.

Adults with uncertain or incomplete history of primary vaccination series with tetanus and diphtheria toxoid-containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses of tetanus and diphtheria toxoid-containing vaccines; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second; Tdap can substitute for any one of the doses of Td in the 3-dose primary series. The booster dose of tetanus and diphtheria toxoid-containing vaccine should be administered to adults who have completed a primary series and if the last vaccination was received ≥ 10 years previously. Tdap or Td vaccine may be used, as indicated.

If a woman is pregnant and received the last Td vaccination ≥ 10 years previously, administer Td during the second or third trimester. If the woman received the last Td vaccination < 10 years previously, administer Tdap during the immediate postpartum period. A dose of Tdap is recommended for postpartum women, close contacts of infants aged < 12 months, and all health-care personnel with direct patient contact if they have not previously received Tdap. An interval as short as 2 years from the last Td is suggested; shorter intervals can be used. Td may be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be administered instead of Td to a pregnant woman.

Consult the ACIP statement for recommendations for giving Td as prophylaxis in wound management.

2. Human papillomavirus (HPV) vaccination

HPV vaccination is recommended at age 11 or 12 years with catch-up vaccination at ages 13 through 26 years.

Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, females who are sexually active should still be vaccinated consistent with age-based recommendations. Sexually active females who have not been infected with any of the four HPV vaccine types (types 6, 11, 16, 18 all of which HPV4 prevents) or any of the two HPV vaccine types (types 16 and 18 both of which HPV2 prevents) receive the full benefit of the vaccination. Vaccination is less beneficial for females who have already been infected with one or more of the HPV vaccine types. HPV4 or HPV2 can be administered to persons with a history of genital warts, abnormal Papanicolaou test, or positive HPV DNA test, because these conditions are not evidence of prior infection with all vaccine HPV types.

HPV4 may be administered to males aged 9 through 26 years to reduce their likelihood of acquiring genital warts. HPV4 would be most effective when administered before exposure to HPV through sexual contact.

A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 1–2 months after the first dose; the third dose should be administered 6 months after the first dose.

Although HPV vaccination is not specifically recommended for persons with the medical indications described in Figure 2, "Vaccines that might be indicated for adults based on medical and other indications," it may be administered to these persons because the HPV vaccine is not a live-virus vaccine. However, the immune response and vaccine efficacy might be less for persons with the medical indications described in Figure 2 than in persons who do not have the medical indications described or who are immunocompetent. Health-care personnel are not at increased risk because of occupational exposure, and should be vaccinated consistent with age-based recommendations.

3. Varicella vaccination

All adults without evidence of immunity to varicella should receive 2 doses of single-antigen varicella vaccine if not previously vaccinated or the second dose if they have received only 1 dose, unless they have a medical contraindication. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., health-care personnel and family contacts of persons with immunocompromising conditions) or 2) are at high risk for exposure or transmission (e.g., teachers; 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 personnel 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 to a laboratory-confirmed case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on diagnosis or verification of herpes zoster by a health-care provider; or 5) laboratory evidence of immunity or laboratory confirmation of disease.

Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. The second dose should be administered 4–8 weeks after the first dose.

4. Herpes zoster vaccination

A single dose of zoster vaccine is recommended for adults aged ≥ 60 years regardless of whether they report a prior episode of herpes zoster. Persons with chronic medical conditions may

be vaccinated unless their condition constitutes a contraindication.

5. Measles, mumps, rubella (MMR) vaccination

Adults born before 1957 generally are considered immune to measles and mumps.

Measles component: Adults born during or after 1957 should receive 1 or more doses of MMR vaccine unless they have 1) a medical contraindication; 2) documentation of vaccination with 1 or more doses of MMR vaccine; 3) laboratory evidence of immunity; or 4) documentation of physician-diagnosed measles.

A second dose of MMR vaccine, administered 4 weeks after the first dose, is recommended for adults who 1) have been recently exposed to measles or are in an outbreak setting; 2) have been vaccinated previously 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.

Mumps component: Adults born during or after 1957 should receive 1 dose of MMR vaccine unless they have 1) a medical contraindication; 2) documentation of vaccination with 1 or more doses of MMR vaccine; 3) laboratory evidence of immunity; or 4) documentation of physician-diagnosed mumps.

A second dose of MMR vaccine, administered 4 weeks after the first dose, is recommended for adults who 1) live in a community experiencing a mumps outbreak and are in an affected age group; 2) are students in postsecondary educational institutions; 3) work in a health-care facility; or 4) plan to travel internationally.

Rubella component: 1 dose of MMR vaccine is recommended for women who do not have documentation of rubella vaccination, or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, rubella immunity should be determined and women should be counseled regarding congenital rubella syndrome. 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.

Health-care personnel born before 1957: For unvaccinated health-care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health-care facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval (for measles and mumps) and 1 dose of MMR vaccine (for rubella), respectively.

During outbreaks, health-care facilities should recommend that unvaccinated health-care personnel born before 1957, who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, receive 2 doses of MMR vaccine during an outbreak of measles or mumps, and 1 dose during an outbreak of rubella.

Complete information about evidence of immunity is available at www.cdc.gov/vaccines/recs/provisional/default.htm.

6. Seasonal Influenza vaccination

Vaccinate all persons aged ≥ 50 years and any younger persons who would like to decrease their risk of getting influenza. Vaccinate persons aged 19 through 49 years with any of the following indications.

Medical: Chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus; renal or hepatic dysfunction, hemoglobinopathies, or immunocompromising conditions (including immunocompromising conditions caused by medications or HIV); cognitive, neurologic or neuromuscular disorders; 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: All health-care personnel, including those employed by long-term care and assisted-living facilities, and caregivers of children aged < 5 years.

Other: Residents of nursing homes and other long-term care and assisted-living facilities; persons likely to transmit influenza to persons at high risk (e.g., in-home household contacts and caregivers of children aged < 5 years, persons aged ≥ 50 years, and persons of all ages with high-risk conditions).

Healthy, nonpregnant adults aged < 50 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special-care units may receive either intranasally administered live, attenuated influenza vaccine (FluMist) or inactivated vaccine. Other persons should receive the inactivated vaccine.

7. Pneumococcal polysaccharide (PPSV) vaccination

Vaccinate all persons with the following indications.

Medical: Chronic lung disease (including asthma); chronic cardiovascular diseases; diabetes mellitus; chronic liver diseases, cirrhosis; chronic alcoholism; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunocompromising conditions including chronic renal failure or nephrotic syndrome; and cochlear implants and cerebrospinal fluid leaks. Vaccinate as close to HIV diagnosis as possible.

Other: Residents of nursing homes or long-term care facilities and persons who smoke cigarettes. Routine use of PPSV is not recommended for American Indians/Alaska Natives or persons aged < 65 years unless they have underlying medical conditions that are PPSV indications. However, public health authorities may consider recommending PPSV for American Indians/Alaska Natives and persons aged 50 through 64 years who are living in areas where the risk for invasive pneumococcal disease is increased.

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Lessons from Recent Health Care-Associated Infections in Outpatient Settings

Moon Kim, MD, MPH

Clara Tyson, RN, BSN, PHN

Physicians and nurses in the Acute Communicable Disease Control program for the Los Angeles County Department of Public Health conducted several investigations to determine the potential source of infections in individual patients and clusters of patients who had seen their outpatient medical providers. Among the infectious agents found were hepatitis B, hepatitis C, *Mycobacterium chelonae*, *Alcaligenes xylosoxidans*, *Staphylococcus aureus* (both methicillin-resistant and sensitive), and *Enterobacter cloacae*.^{1,2,3,4}

The investigations found breaches in infection control practices that resulted in transmission of bloodborne or other microbial pathogens to patients by health care workers during patient office visits. Such breaches included no hand-washing; poor aseptic technique with injection preparation; inappropriate infusion administration, medication vial handling, preparation and storage; failure to maintain designated clean areas for medication and procedure preparation; and inadequate cleaning, disinfection and sterilization of reusable medical equipment.

The investigations also revealed a commonly noted problem: the incorrect use of single-dose and multi-dose medication vials. Staff in outpatient clinics were observed to incorrectly use single-dose vials of medication for several patients, reuse the vials more than one time, and keep multi-dose vials open inappropriately for several days. These lapses in infection control practice have resulted in serious, costly and preventable medical conditions.

In the United States, outbreaks of hepatitis C have occurred in outpatient settings as a result of improper use of syringes,

needles, and medication vials during numerous routine health care procedures.^{5,6,7}

Many outpatient medical clinics lack written infection control policies and procedures for their health care workers to follow, or lack mechanisms for monitoring and ensuring use of good infection control practices.

Physicians commonly write orders for a combination of medications or injectable vitamins for administration through one intramuscular injection. Some staff were noted using inappropriate technique by withdrawing solution from each separate vial (some up to three vials) with the same syringe and needle used to administer to the patient. The facilities did not have written protocols or procedures for the health care workers to follow to ensure that the correct aseptic technique was used and that training was maintained. For this reason, written procedures are highly recommended.

Lapses in aseptic technique are a problem nationally, as reported recently by the Centers for Disease Control and Prevention.⁸

Action Plan for Infection Control Procedures

Unlike acute care hospitals and outpatient surgical centers in California, outpatient medical clinics are not routinely monitored or supported by regulatory bodies, such as the State Health Facilities Inspection Division, the Joint Commission, or infection control committees. Therefore, it is important for outpatient medical clinics to be proactive and remain current on infection control procedures to prevent disease transmission. The following actions should be taken:

- Establish infection control policies and procedures tailored to the services provided. Review and update regularly.
- Conduct regular training and provide updates on these policies and procedures for health care workers.

Brief Survey of Infection Control Policies and Procedures

Review the following questions to assess a practice's infection control policies and procedures. All of the answers should be Yes. Any answers to the contrary should be discussed with an infection control consultant or risk manager.

- Are there written infection control policies and procedures for the outpatient office?
- Do physicians and medical office staff regularly review or update the infection control policies and procedures?
- Does the facility have a quality assurance program?
- Do physicians and other licensed personnel know the difference between proper use of single-dose and multi-dose vials of medication? Do they know how long single-dose and multi-dose medication vials may stay open once the seal is broken?⁹
- Are health care workers familiar with and currently practicing the correct procedure and aseptic technique for drawing up medications for injection?
- Are physicians able to monitor the infection control practices of staff in the office to identify and prevent any potential breaches of aseptic technique?
- Do physicians and staff know the difference between disinfection and sterilization? Are the appropriate steps taken and quality assurance measures performed to ensure proper disinfection and sterilization of reusable medical equipment and supplies? Are documentation logs maintained?
- Do physicians know who is and who is not allowed to perform routine medical procedures, according to the Medical Board of California?

- Provide documentation of training and competency of skills to ensure that safe practices and techniques are mastered.
- Hire an infection control consultant, if needed, who can write policies and procedures and train the staff to adhere to national standards of infection control.
- Utilize the following resources:

Infection Control in Healthcare Settings

www.cdc.gov/ncidod/dhqp/index.html

Injection Safety FAQs for Providers

www.cdc.gov/ncidod/dhqp/injectionSafetyFAQs.html

Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008

www.cdc.gov/ncidod/dhqp/sterile.html

Medical Assistant Scope of Practice

www.mbc.ca.gov/allied/medical_assistants_questions.html

Office support, such as medical assistants (MAs), need to work within their scope of practice and not perform the duties of a licensed health care professional.

The Medical Board of California link above outlines the scope of practice for MAs and discusses the requirements of physicians and nurses to regularly document the training and competency of the MAs in their practice. 

Moon Kim, MD, MPH, is a medical epidemiologist, and **Clara Tyson, RN, BSN, PHN**, is a program specialist for the Acute Communicable Disease Control Program, Los Angeles County Department of Public Health.

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Recommendations for Effective Infection Control Practice in the Outpatient Medical Clinic

DOs

- Always wash hands prior to obtaining supplies and handling medication vials and IV solutions.
- Maintain separate “clean” and “dirty” areas: Prepare medication on a clean surface in a “clean” area.
- Strictly adhere to aseptic technique when handling medication vials, mixing more than one medication for one injection, administering injections, and performing glucose monitoring. Always ensure medication compatibility by consulting with the pharmacist when mixing more than one medication. Create written protocols for staff to follow.
- Always follow the manufacturer’s instructions for storage and usage of medication vials.
- Always use a sterile syringe and needle when entering a medication vial.
- Enter a single-dose medication vial with a needle only one time and for ONE patient only, and then discard. No re-entry.
- On all multi-dose vials, write the date when opened.
- Discard EXPIRED medications.
- Always follow the manufacturer’s recommendations and guidelines for cleaning, disinfecting, and sterilizing reusable medical equipment.
- Maintain documentation logs for cleaning, disinfection, and sterilization of equipment and supplies.
- Develop comprehensive infection control policies for medical staff. Then ensure proper orientation, training, and regular monitoring.

DON'Ts

- Never enter a vial with a syringe and needle that has been used on a patient.
- Never use the same syringe for more than one patient, even if the needle is changed between patients.
- Do not use single-dose medication vials for more than one patient and do not combine leftover contents for later use. Do not re-enter single-dose vials for another use.
- Never use bags or bottles of IV solution as a common source to obtain flush solutions or diluents for multiple patients.
- Never store unwrapped needles and syringes.
- Never allow non-licensed staff to start IVs or administer medication through an IV line.
- Never leave a needle or spike devices inserted inside the rubber stopper of a medication vial that will be used on a patient at a later date.
- Do not leave multi-dose medication vials open for more than 28 days (less if indicated by the pharmaceutical company or if the vials expire prior to the 28 days).

TUBERCULOSIS IN LA COUNTY

A Daily Collaborative for Success

Frank Alvarez, MD, MPH

The collective efforts of Los Angeles County's public health department and medical community to manage and treat tuberculosis have been remarkable. However, an ongoing battle against this challenging and still deadly infectious disease remains.

Although the decrease in the number of cases is positive (from a peak of 2,100 TB cases in 1992, to 706 cases in 2009),¹ LA County is a microcosm of the global challenge of TB control and elimination. Worldwide, more than 9 million cases are reported and more than 1.5 million deaths occur every year. Unfortunately, in many countries with limited resources, therapies run short or are unavailable. This gives rise to drug-resistant strains.

Globally, there are an estimated half-million multi-drug-resistant (MDR) cases.² Some of the strains evolved from single-drug-resistant TB to MDR-TB, and now, some have become extensively drug-resistant (XDR). By the end of 2008, 55 countries and territories had reported at least one case of XDR-TB.² Locally, LA County continues to see its share of MDR cases (116 from 1998 through 2008). The emerging threat of MDR and XDR-TB requires vigilance and action.

In response, we must:

- Ensure use of rapid diagnostic methods and timely public health reporting.
- Provide appropriate and complete therapy wherever TB is managed.
- Ensure availability of care for all individuals—whether insured or not.
- Provide directly observed therapy (DOT) to guarantee completion of therapy.



CDC/ Janice Haney Carr

Under a high magnification of 15549x, this colorized scanning electron micrograph depicts some of the ultrastructural details seen in the cell wall configuration of a number of Gram-positive *Mycobacterium tuberculosis* bacteria.

Physicians in the Community Are Crucial

Private medical practitioners can make an important contribution to the control of TB through timely suspicion and early diagnosis and treatment.

Since many TB patients have non-TB comorbidities and are managed in the private-sector, intra-provider communication is crucial to ensure that combination treatment regimens do not reduce the effectiveness of TB treatments. These efforts yield greater continuity, acceptance, adherence and completion of TB care.

LA County has local clinic-based practitioners, hospital-based specialists, frontline community workers, distinguished TB researchers, public health nurses, and CDC medical officers committed to controlling TB. Working together with daily attention to TB medical care and infectious disease control, we can control and one day eliminate this ancient enemy.

TB and At-Risk Populations

TB continues to place additional burdens upon medically vulnerable individuals. Patients who are immuno-compromised (e.g., HIV-infected) and those who have other medical conditions (e.g., diabetes, cancer, and substance abuse) are among the vulnerable populations and have significant comorbidities and mortality.

Among foreign-born individuals TB remains disproportionately high. In the United States in 2008, 59% of TB cases were among the foreign-born. The proportion was even higher in Los Angeles County, where 76.9% of cases were foreign-born.

In 2008, Hispanics composed the largest proportion of cases in the county (370 cases, 46.7%), followed by Asians (278 cases, 35.1%).

To eliminate TB locally and globally will require targeted interventions for at-risk populations, continued collaborative efforts toward the global and local fight against TB, and adequate resources. Over the past few years, the Los Angeles County TB Control Program has partnered with community organizations, including the American Lung Association in California and AIDS Healthcare Foundation to form a TB Coalition that provides education and outreach to at-risk populations in the county.

—David Meyer, CPH, MPH
Epidemiologist, Tuberculosis Control Program

Medical Advisory Group Is a Community Collaboration

In the spirit of community collaboration, the Department of Public Health seeks physicians' commitment to this cause. We are actively recruiting those with TB expertise and interest to serve on a newly created LA County TB Control and Elimination Medical Advisory Group—an alliance for a local and global initiative to stop TB. The primary objective of this group will be to improve coordination and continuity of quality TB care for all cases and their contacts throughout LA County.

To join the Medical Advisory Group, contact the TB Control Program at www.publichealth.lacounty.gov/tb and click on “comment” at the top of the homepage. 

Frank Alvarez, MD, MPH, is the director, Tuberculosis Control Program, Los Angeles County Department of Public Health.

NOTES

1. Data for 2009 are provisional, Los Angeles County Department of Public Health.
2. WHO Report Global TB Control 2009.

Upcoming Immunization Awareness Campaigns

Celebrate National Infant Immunization Week (April 24-May 1) and Toddler Immunization Month (May) by implementing the following evidence-based practices, which are recommended by the Task Force on Community Preventive Services (www.thecommunityguide.org):

- Client reminder and recall systems that remind parents/patients when vaccines are due or overdue, respectively.
- Provider prompts, such as chart stickers, electronic health records, and/or an immunization registry, to remind providers about vaccines that patients are due to receive on the day of their visit.
- Standardized nursing procedures, which allow clinicians to vaccinate clients who meet approved criteria without a patient-specific physician order.

To auto-generate client and provider reminders, use the California Immunization Registry. Visit www.immunizelink.org, or call (213) 351-7411.

IMMUNIZATION SCHEDULE FOOTNOTES from page 7

8. Revaccination with PPSV

One-time revaccination after 5 years is recommended for persons with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); and for persons with immunocompromising conditions. For persons aged ≥65 years, one-time revaccination is recommended if they were vaccinated ≥5 years previously and were younger than aged <65 years at the time of primary vaccination.

9. Hepatitis A vaccination

Vaccinate persons with any of the following indications and any person seeking protection from hepatitis A virus (HAV) infection.

Behavioral: Men who have sex with men and persons who use injection drugs.

Occupational: Persons working with HAV-infected primates or with HAV in a research laboratory setting.

Medical: Persons with chronic liver disease and persons who receive clotting factor concentrates.

Other: Persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at wwwn.cdc.gov/travel/content/diseases.aspx).

Unvaccinated persons who anticipate close personal contact (e.g., household contact or regular babysitting) with an international adoptee from a country of high or intermediate endemicity during the first 60 days after arrival of the adoptee in the United States should consider vaccination. The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally ≥2 weeks before the arrival of the adoptee.

Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6–12 months (Havrix), or 0 and 6–18 months (Vaqta). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule, administered on days 0, 7, and 21–30 followed by a booster dose at month 12 may be used.

10. Hepatitis B vaccination

Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection.

Behavioral: Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection-drug users; and men who have sex with men.

Occupational: Health-care personnel and public-safety workers who are exposed to blood or other potentially infectious body fluids.

Medical: Persons with end-stage renal disease, including patients receiving hemodialysis; persons with HIV infection; and persons with chronic liver disease.

Other: Household contacts and sex partners of persons with chronic HBV infection; clients and staff members of institutions for persons with developmental disabilities; and international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at wwwn.cdc.gov/travel/content/diseases.aspx).

Hepatitis B vaccination is recommended for all adults in the following settings: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings targeting services to 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.

Administer or complete a 3-dose series of HepB to those persons not previously vaccinated. The second dose should be administered 1 month after the first dose; the third dose should be administered at least 2 months after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule, administered on days 0, 7, and 21–30 followed by a booster dose at month 12 may be used.

Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 µg/mL (Recombivax HB) administered on a 3-dose schedule or 2 doses of 20 µg/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2 and 6 months.

11. Meningococcal vaccination

Meningococcal vaccine should be administered to persons with the following indications.

Medical: Adults with anatomic or functional asplenia, or persistent complement component deficiencies.

Other: First-year college students living in dormitories; microbiologists 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 through June]), particularly if their 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 (MCV4) is preferred for adults with any of the preceding indications who are aged ≤55 years; meningococcal polysaccharide vaccine (MPSV4) is preferred for adults aged ≥56 years. Revaccination with MCV4 after 5 years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia). Persons whose only risk factor is living in on-campus housing are not recommended to receive an additional dose.

12. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used

Hib vaccine generally is not recommended for persons aged ≥5 years. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or who have had a splenectomy. Administering 1 dose of Hib vaccine to these high-risk persons who have not previously received Hib vaccine is not contraindicated.

13. Immunocompromising conditions

Inactivated vaccines generally are acceptable (e.g., pneumococcal, meningococcal, influenza [inactivated influenza vaccine]) and live vaccines generally are avoided in persons with immune deficiencies or immunocompromising conditions. Information on specific conditions is available at www.cdc.gov/vaccines/pubs/acip-list.htm.

Rx for Prevention is published 10 times a year by the Los Angeles County Department of Public Health. If you would like to receive this newsletter by e-mail, go to www.publichealth.lacounty.gov and subscribe to the ListServ for *Rx for Prevention*.

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Index of Disease Reporting Forms

All case reporting forms from the LA County Department of Public Health are available by telephone or Internet.

Animal Bite Report Form

Veterinary Public Health (877) 747-2243
www.publichealth.lacounty.gov/vet/biteintro.htm

Animal Diseases and Syndrome Report Form

Veterinary Public Health (877) 747-2243
www.publichealth.lacounty.gov/vet/disintro.htm

Adult HIV/AIDS Case Report Form

For patients over 13 years of age at time of diagnosis
HIV Epidemiology Program
(213) 351-8196
www.publichealth.lacounty.gov/HIV/hivreporting.htm

Pediatric HIV/AIDS Case Report Form

For patients less than 13 years of age at time of diagnosis
Pediatric AIDS Surveillance Program
(213) 351-8153
Must first call program before reporting
www.publichealth.lacounty.gov/HIV/hivreporting.htm

Confidential Morbidity Report of Tuberculosis (TB) Suspects & Cases
Tuberculosis Control (213) 744-6160
www.publichealth.lacounty.gov/tb/forms/cmr.pdf

Lead Reporting

No reporting form. Reports are taken over the phone.
Lead Program (323) 869-7195

Reportable Diseases & Conditions Confidential Morbidity Report
Morbidity Unit (888) 397-3993
Acute Communicable Disease Control (213) 240-7941
www.publichealth.lacounty.gov/acd/reports/CMR-H-794.pdf

Sexually Transmitted Disease Confidential Morbidity Report
(213) 744-3070

www.publichealth.lacounty.gov/std/providers.htm (web page)
www.publichealth.lacounty.gov/std/docs/H1911A.pdf (form)