MARYLAND HEALTHCARE WORKERS INFLUENZA INITIATIVE

2008 TOOLKIT

Sponsored by
Maryland Partnership for Prevention
Maryland Department of Health and Mental Hygiene

Maryland Healthcare Workers Influenza Initiative

Dear Partner in Prevention:

We are delighted to have you as a partner in the 2008 *Maryland Healthcare Workers Influenza Initiative*, a collaborative effort between the Maryland Department of Health and Mental Hygiene (DHMH), Maryland Partnership for Prevention, and health care facilities and professional associations across Maryland.

For the past four years, this partnership has joined campaigns across the country in promoting influenza vaccinations among health care workers. This year, we expand our efforts by sponsoring a multi-pronged initiative to assist Maryland's health care facilities in improving influenza and other vaccination rates among their workers. This program features a toolkit to facilitate a successful facility-wide campaign, grants to assist with vaccination promotion efforts, and awards for immunization excellence.

Among the resources in the 2008 *Maryland Supplement to Campaigns to Increase Influenza Vaccinations Among Healthcare Workers* are:

- Frequently Asked Questions about the Maryland Healthcare Workers Influenza Initiative
- "Resources and Strategies" for improving health care worker influenza vaccinations
- Morbidity and Mortality Weekly Report, *Influenza Vaccination of Health-Care Personnel.*
- Template Policy Statement: Policy for Influenza Immunization of Health Care Workers
- CDC Netconference slides, "Health Care Personnel--What Immunizations are Advised?"
- Maryland nursing home law regarding health care worker influenza vaccinations
- Standing Orders for Administering Influenza Vaccine to Adults
- New Infection Control Requirement for Offering Influenza Vaccination to Staff
- Campaign Strategies for Vaccinating Health Care Workers
- Vaccine Administration Record and Consent Form for Influenza Vaccine
- Sample Declination Form
- Vaccine Information Statements (VIS) for injectable and intranasal influenza vaccine

Please use the supplement to enhance your facility's efforts to increase flu vaccinations among health care workers. To become a Registered Partner of the Maryland Healthcare Workers Influenza Initiative, complete and submit the online Registered Partners Survey that can be accessed through www.EDCP.org.

We appreciate your commitment to raising influenza vaccination rates of health care workers in Maryland and look forward to working with you. Should you require additional information about this initiative, call Robin Decker at 410-767-6679 or Tiffany Tate at 410-902-4677.

Sincerely,

2008 Maryland Healthcare Workers Influenza Initiative Planning Committee

Table of Contents

2008 Maryland Supplement

2008 Maryland Healthcare Workers Influenza Initiative

What is the Maryland Healthcare Workers Influenza Initiative?
A statewide campaign that aims to raise influenza vaccination rates among health care providers.

Who should participate?
Facilities, organizations, and community providers of health care with an interest in increasing influenza vaccination rates among their employees and wish to protect their staff and clients from the flu. This may include, but is not limited to:

- Hospitals
- Local health departments
- Skilled nursing facilities
- Private physicians' offices
- Home health agencies
- Colleges and Universities
- Adult day care services
- Continuing care retirement communities
- Any provider of health care services and or staff who serve persons at risk from complications of influenza.

Why should I participate in this initiative?
The Maryland Healthcare Workers Influenza Initiative will **provide resources to support influenza vaccination programs for all staff who work in health care settings.**

What types of resources will be provided through this initiative?
Participants in the Maryland Healthcare Workers Influenza Initiative will have access to resources to assist in efforts to increase influenza immunization rates among health care personnel. *Registered Partners* will be eligible to apply for grants to help fund their facility's influenza vaccination campaign.

How do I become a *Registered Partner* of the initiative?

1. **Complete and submit the online Registration Survey**. To access the survey, click on the survey link at http://www.edcp.org/html/hcw_initiative.html .
2. Use the **Maryland Supplement to Campaigns to Increase Influenza Vaccinations Among Healthcare Workers** that will be mailed to you in hardcopy following completion of your survey.
3. If interested, **complete and return the Grant Application** by **September 15, 2008**, which will be emailed to you following completion of the survey.
4. **Report** your facility's employee vaccination rate at the end of the 2008-2009 Flu Prevention Season.

Who do I call for more information?

- Robin Decker at the DHMH Center for Immunization - 410-767-6679
- Maryland Partnership for Prevention - 410-902-4677

Maryland Healthcare Workers Influenza Initiative

Resources and Strategies

The list directs you to highlights of documents that may be helpful in developing campaigns to promote vaccinations among health care workers. These documents can be obtained at www.edcp.org or at the websites specified.

Improving Influenza Vaccination Rates in Health Care Workers

(24-page document; available at http://www.nfid.org/pdf/publications/hcwmonograph.pdf)

- Page 8 — Introduction to *Call to Action*
- Page 9 — Keys to Improving Health Care Worker Vaccination Rates
- Pages 10-12 — Impact of Influenza Among Health Care Workers
- Pages 15-17 — Strategies to Increase Vaccination Rates

MassMed Employee Flu Immunization Campaign Kit

(Link available through www.edcp.org)

- Page 12 — Assessment Worksheet
- Page 18 — Influenza Campaign Poster
- Page 23 — "Why People Don't Get Vaccinated"
- Page 26 — Tips for Planning a Kick-Off Event
- Page 27 — Tips for Making Flu Campaigns Fun
- Page 30 — Operating Clinics and Tracking Progress
- Page 32 — Vaccine Administration Record
- Page 34 — Sample Vaccine Declination Tracking Form
- Page 37 — Celebrate Success and Plan for Next Year

Influence® Health Care Workers Materials

(Available at www.vaccinemanager.com)

- FREE, customizable collection of disease educational materials developed to encourage influenza immunization. To gain access the first time, you will be asked to create a user name and password.

Other Resources

- National Influenza Vaccination Week Toolkit: http://www.cdc.gov/flu/nivw/toolkit.htm

Other Resources (cont.)

- Influenza Vaccination of Health-Care Personnel: Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP): http://www.cdc.gov/MMWR/preview/mmwrhtml/rr5502a1.htm; February 24, 2006.
- 2007 Prevention and Control of Influenza: Recommendations of the Advisory Commission on Immunization Practices: http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf; July 13, 2007

- MMWR Article: Interventions to Increase Influenza Vaccination Among Health Care Workers: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5408a2.htm; March 4, 2005.
- Immunization Action Coalition: www.immunize.org
- CDC Live Attenuated Influenza Vaccine Recommendations: http://www.cdc.gov/flu/professionals/acip/index.htm.
- CDC Flu Information for Health Care Professionals: http://www.cdc.gov/flu/professionals/
- CDC Updated Infection Control Measures for the Prevention and Control of Influenza in Health-Care Facilities: http://www.cdc.gov/flu/professionals/infectioncontrol/healthcarefacilities.htm
- CDC Updated Infection Control Measures for Preventing and Controlling Influenza Transmission in Long Term Care Facilities: http://www.cdc.gov/flu/professionals/infectioncontrol/longtermcare.htm
- United States Department of Veterans Affairs VA Influenza Vaccination Toolkit: http://www.publichealth.va.gov/Flu/flu_toolkit.htm

Healthcare Personnel Vaccination Recommendations

Vaccine	Recommendations in brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1–2 months after dose #3.
Influenza	Give 1 dose of TIV or LAIV annually. Give TIV intramuscularly or LAIV intranasally.
MMR	For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give SC.
Varicella (chickenpox)	For HCP who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus, diphtheria, pertussis	Give all HCP a Td booster dose every 10 years, following the completion of the primary 3-dose series. Give a 1-time dose of Tdap to all HCP younger than age 65 years with direct patient contact. Give IM.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of *N. meningitidis.*

Hepatitis A, typhoid, and polio vaccines are not routinely recommended for HCP who may have on-the-job exposure to fecal material.

Hepatitis B

Healthcare personnel (HCP) who perform tasks that may involve exposure to blood or body fluids should receive a 3-dose series of hepatitis B vaccine at 0-, 1-, and 6-month intervals. Test for hepatitis B surface antibody (anti-HBs) to document immunity 1–2 months after dose #3.

- If anti-HBs is at least 10 mIU/mL (positive), the patient is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the patient is unprotected from hepatitis B virus (HBV) infection; revaccinate with a 3-dose series. Retest anti-HBs 1–2 months after dose #3.
  - If anti-HBs is positive, the patient is immune. No further testing or vaccination is recommended.
  - If anti-HBs is negative following 6 doses of vaccine, the patient is a non-responder.

For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood.[1] It is also possible that non-responders are persons who are HBsAg positive. Testing should be considered. HCP found to be HBsAg positive should be counseled and medically evaluated.

Note: Anti-HBs testing is not recommended routinely for previously vaccinated HCP who were not tested 1–2 months after their original vaccine series. These HCP should be tested for anti-HBs when they have an exposure to blood or body fluids. If found to be anti-HBs negative, the HCP should be treated as if susceptible.[1]

Influenza

Trivalent (Inactivated) Influenza Vaccine (TIV): May give to any HCP.
Live, Attenuated Influenza Vaccine (LAIV): May give to any non-pregnant healthy HCP age 49 years and younger.

1. All HCP should receive annual influenza vaccine. Groups that should be targeted include all personnel (including volunteers) in hospitals, outpatient, and home-health settings who have any patient contact.
2. TIV is preferred over LAIV for HCP who are in close contact with severely immunosuppressed persons (e.g., stem cell transplant patients) when patients require a protective environment.

Measles, Mumps, Rubella (MMR)

HCP who work in medical facilities should be immune to measles, mumps, and rubella.

- HCP born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) physician-diagnosed measles or mumps disease; or (b) laboratory evidence of measles, mumps, or rubella immunity (HCP who have an "indeterminate" or "equivocal" level of immunity upon testing should be considered nonimmune); or (c) appropriate vaccination against measles, mumps, and rubella (i.e., administration on or after the first birthday of two doses of live measles and mumps vaccines separated by 28 days or more, and at least one dose of live rubella vaccine).
- Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, healthcare facilities should consider recommending a dose of MMR vaccine (two doses during a mumps outbreak) to unvaccinated HCP born before 1957 who are in either of the following categories: (a) do not have a history of physician-diagnosed measles and mumps disease or laboratory evidence of measles and mumps immunity and (b) do not have laboratory evidence of rubella immunity.

Varicella

It is recommended that all HCP be immune to varicella. Evidence of immunity in HCP includes documentation of 2 doses of varicella vaccine given at least 28 days apart, history of varicella or herpes zoster based on physician diagnosis, laboratory evidence of immunity, or laboratory confirmation of disease.

Tetanus/Diphtheria/Pertussis (Td/Tdap)

All adults who have completed a primary series of a tetanus/diphtheria-containing product (DTP, DTaP, DT, Td) should receive Td boosters every 10 years. As soon as feasible, HCP younger than age 65 years with direct patient contact should be given a 1-time dose of Tdap, with priority given to those having contact with infants younger than age 12 months.

Meningococcal

Vaccination is recommended for microbiologists who are routinely exposed to isolates of *N. meningitidis.* Use of MCV4 is preferred for persons younger than age 56 years; give IM. If MCV4 is unavailable, MPSV is an acceptable alternative for HCP younger than age 56 years. Use of MPSV is recommended for HCP older than age 55; give SC.

References

1. See Table 3 in "Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis," *MMWR*, June 29, 2001, Vol. 50, RR-11.

For additional specific ACIP recommendations, refer to the official ACIP statements published in *MMWR.* To obtain copies, visit CDC's website at www.cdc.gov/vaccines/pubs/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

Adapted with thanks from the Michigan Department of Community Health

Technical content reviewed by the Centers for Disease Control and Prevention, July 2008.

www.immunize.org/catg.d/p2017.pdf • Item #P2017 (7/08)

First do no harm

Protect patients by making sure all staff receive yearly influenza vaccine!

Healthcare employers are not only strongly encouraged to increase their employees' influenza immunization rates, in some instances, their organization's accreditation depends on it! The Centers for Disease Control and Prevention (CDC) published recommendations for healthcare settings, and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has established influenza infection control standards.

Big changes have taken place in influenza vaccination of healthcare personnel (HCP): The responsibility for increasing the rates of HCP influenza vaccination is rapidly shifting from the employee to the employer.

What's happened?

At CDC: In February 2006, CDC published "Influenza Vaccination of Health-Care Personnel." These recommendations "apply to HCP in acute care hospitals, nursing homes, skilled nursing facilities, physician offices, urgent care centers, and outpatient clinics, and to persons who provide home healthcare and emergency medical services." They were issued jointly by HICPAC (the Healthcare Infection Control Practices Advisory Committee) and ACIP (the Advisory Committee on Immunization Practices). The summary box in the right column presents an overview, including the recommendation that employers vaccinate employees at the work site at no cost. To obtain a copy of the complete recommendations, go to: www.cdc.gov/mmwr/PDF/rr/rr5502.pdf.

At JCAHO: In January 2007, a new infection control standard of JCAHO (the Joint Commission on Accreditation of Healthcare Organizations) became effective that requires accredited organizations to offer influenza vaccinations to staff, volunteers, and licensed independent practitioners who have close patient contact. The standard is an accreditation requirement for the Critical Access Hospital, Hospital and Long Term Care accreditation programs. To access the standard, go to www.jcrinc.com/12889 (for critical access hospitals), www.jcrinc.com/12862 (for hospitals), or www.jcrinc.com/12882 (for long-term care).

Why is it happening?

The short answer is because HCP influenza vaccination rates remain appallingly low, and unvaccinated HCP are infecting vulnerable patients with influenza. Fewer than 45% of HCP are immunized against influenza each year, even though ACIP has urged annual influenza vaccination for HCP since 1981. Further, influenza transmission has been documented among patients in a variety of clinical settings, and infections have been linked to unvaccinated HCP. Clearly, we are doing our patients harm.

What should your healthcare facility do to comply?

In the box below are practical online resources healthcare organizations will find valuable in creating influenza vaccination programs for employees.

Practical resources for vaccinating HCP against influenza

Centers for Disease Control and Prevention
Read "Influenza Vaccination of Health-Care Personnel": www.cdc.gov/mmwr/PDF/rr/rr5502.pdf

Access CDC's Influenza web page: www.cdc.gov/flu

National Influenza Vaccine Summit (NIVS) (Co-sponsored by the American Medical Association and CDC). See the NIVS Healthcare Workers home page: www.preventinfluenza.org/profs_workers.asp.

Massachusetts Medical Society
See the "2006 Employee Flu Immunization Campaign Kit": www.massmed.org/flu_kit

Immunization Action Coalition
Get these IAC print materials online:

"Standing Orders for Administering Influenza Vaccine to Adults": www.immunize.org/catg.d/p3074.pdf

"Screening Questionnaire for Injectable Influenza Vaccination": www.immunize.org/catg.d/p4066.pdf

"Screening Questionnaire for Intranasal Influenza Vaccination": www.immunize.org/catg.d/p4067.pdf

"Declination of Influenza Vaccination" form: www.immunize.org/catg.d/p4068.pdf

Summary of CDC's HICPAC / ACIP Recommendations

The committees that developed and endorsed these recommendations included persons with expertise in infectious diseases, infection control, pediatrics, vaccinology, internal medicine, and public health. The recommendations are as follows:

- **Educate HCP regarding the benefits of influenza vaccination** and the potential health consequences of influenza illness for themselves and their patients, the epidemiology and modes of transmission, diagnosis, treatment, and nonvaccine infection control strategies, in accordance with their level of responsibility in preventing health-care-associated influenza.
- **Offer influenza vaccine annually to all eligible HCP** to protect staff, patients, and family members and to decrease HCP absenteeism. Use of either available vaccine (inactivated [TIV] or live attenuated influenza vaccine [LAIV]) is recommended for eligible persons. During periods when TIV is in short supply, use of LAIV is especially encouraged when feasible for eligible HCP.
- **Provide influenza vaccination to HCP at the work site and at no cost** as one component of employee health programs. Use strategies that have been demonstrated to increase influenza vaccine acceptance, including vaccination clinics, mobile carts, vaccination access during all work shifts, and modeling and support by institutional leaders.
- **Obtain a signed declination from HCP who decline influenza vaccination** for reasons other than medical contraindications.
- **Monitor HCP influenza vaccination coverage and declination** at regular intervals during influenza season and provide feedback of ward-, unit-, and specialty-specific rates to staff and administration.
- **Use the level of HCP influenza vaccination coverage as one measure of a patient-safety quality program.**

Technical content reviewed by the Centers for Disease Control and Prevention, August 2007.

www.immunize.org/catg.d/p2014.pdf • Item #P2014 (8/07)

Current Issues in Immunization NetConference

Education, Information, and Partnership Branch of the Immunization Services Division

National Center for Immunization and Respiratory Diseases

CDC

Today's Presenter

Judy V. Schmidt, Ed.D., MSN, MA, RN
Public Health Educator
Immunization Services Division
Centers for Disease Control and Prevention

Healthcare Personnel What Immunizations are Advised?

NetConference – July 12, 2007

Why Increased Attention to Healthcare Personnel (HCP)?

- More reports of hospital-acquired infection
- New findings regarding transmission and lack of immunity against some vaccine-preventable diseases
- New vaccines; new recommendations
- Low HCP vaccination rates for some recommended vaccines

CDC

Overview

- Review recent recommendations for HCP
- Rationale
- Issues and responsibilities
- Summary of "old" recommendations

CDC

Which HCP are Affected by the Recommendations?

- In addition to healthcare personnel in hospitals and health departments, recommendations apply to HCP in private physicians' offices, nursing homes, schools, laboratories, and first responders.
- Any medical facility or health department that provides direct patient care is encouraged to formulate a comprehensive immunization policy for all healthcare personnel.

CDC

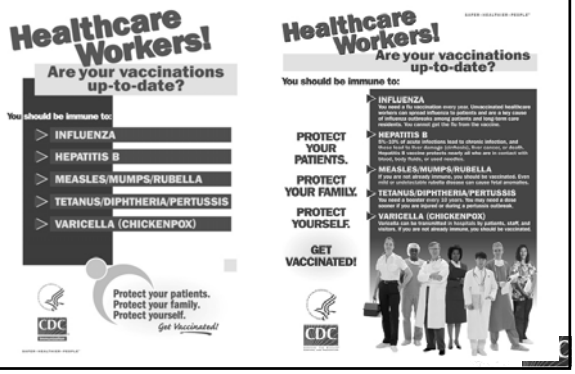
HCP Vaccination: More than Personal Health

- HCPs have direct patient contact and can transmit disease from patient to patient
- HCPs contact infected material from patients
- Transmission of disease throughout healthcare setting—patients, staff, visitors
- HCPs immunity essential to infection prevention and control programs

CDC

http://www.cdc.gov/vaccines/pubs/flyers-brochures.htm

Poster and Flyer



Recommendations for Healthcare Personnel Vaccination *What's New?*

- Hepatitis B - same
- MMR –new mumps recommendation added
- Varicella – no longer depends on clinical specialty
- Td/Tdap - new recommendation for Tdap
- Influenza – old recommendation with new strategies and 2007 JCAHO criteria

CDC

Hepatitis B Vaccine Recommendation

- Personnel performing tasks involving exposure to blood or blood-contaminated body fluids should be vaccinated
- December 1991, Occupational Safety and Health Administration (OSHA) mandates availability of hepatitis B vaccine to all healthcare personnel with occupational exposure

CDC

Hepatitis B Vaccine Recommendation

- Occupational exposure is: "...reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties."
- Postvaccination testing for anti-HBs response is indicated for HCP 1-2 months after series completion

CDC

Rationale for Hepatitis B Vaccine

- Facts:
  - Risk of transmission from needlestick exposure 6%-30%
  - 17,000 infections in 1983
  - 400 infections in 1995
  - 5%-10% of acute infections lead to chronic infection
- Protect HCP, their patients, and colleagues from becoming infected through exposure to infection

CDC

Common Questions about Hepatitis B Vaccine Series

Postvaccination Testing and Vaccine Nonresponder

What if a HCP tests non-immune 1-2 months after completing the hepatitis B vaccine series

Hepatitis B Vaccine Non-responder

Complete another 3-dose series and test again in 1-2 months

- 30%-50% will respond after three additional doses

Persistent Non-responder to Hepatitis B Vaccine

What if a HCP does not respond to 6 doses (2 complete series) of hepatitis B vaccine?

Persistent Nonresponder to Hepatitis B Vaccine

What if a HCP does not respond to 6 doses (2 complete series) of hepatitis B vaccine?

ACIP recommends no further vaccine.

Treat as a nonresponder (susceptible) following hepatitis B exposure.

Interruption of Vaccine Series

If the hepatitis B vaccine series is interrupted do we restart the series or add extra doses?

Interruption of Vaccine Series

If the vaccine series is interrupted do we restart the series or add extra doses?

No – just complete the remaining doses of the series

Measles and Rubella Vaccine Recommendation

- Persons who work in medical facilities should be immune to measles and rubella.
- All medical institutions–inpatient and outpatient, public and private–should ensure that those who work in their facilities are immune to measles and rubella.
- Likewise, HCP have a responsibility to avoid causing harm to patients by preventing transmission of these diseases.

Measles Vaccine Rationale

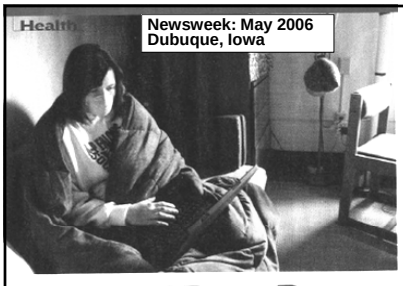
- Nosocomial measles transmission has been documented in the offices of private physicians, in emergency rooms, and on hospital wards
- Risk of measles infection in medical personnel estimated to be 13-fold greater than in general population
- 13.9% of cases during 1992-1995 occurred in medical settings
- Current risk exists - 2005 Indiana outbreak of 34 cases resulted from 1 imported case

HCP Immunity to Measles and Rubella

If born in or after 1957, immunity is:

- Physician-diagnosed measles [not rubella]; OR
- Documentation of laboratory evidence of measles and rubella immunity (equivocal result = nonimmune status); OR
- Two doses of MMR (or 1 rubella, 2 measles) given at least 28 days apart

If born before 1957 and unvaccinated, consider a dose of MMR vaccine if no history of measles disease or no laboratory evidence of immunity –
5-9% tested as nonimmune

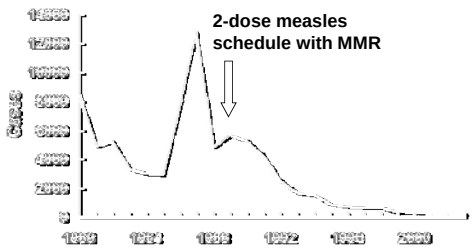


1956 Philadelphia

Findings of 2006 Mumps Outbreak

- 2,597 cases of mumps in 11 states and 5,783 in 45 states by October
- U.S. mumps vaccine efficacy data
  - 70%-80% after one dose
  - 90%-95% after two doses
- Finland eliminated mumps through high and sustained coverage using 2 doses MMR vaccine

Mumps – United States, 1980- 2003



Rationale for Updated 2006 Mumps Vaccine Recommendation

- Infection-control failures resulting in nosocomial transmission have occurred during mumps outbreaks involving hospitals and long-term-care facilities
- Exposures to mumps in healthcare settings add economic costs – e.g., furlough or reassignment of staff members, or closure of wards
- Persons with only one dose of mumps-containing vaccine are more susceptible to mumps disease

Mumps Immunity Definition

- History of physician-diagnosed mumps OR
- Laboratory evidence of mumps immunity OR
- Appropriate vaccine doses

Mumps Vaccine Recommendations for HCP

- All persons who work in healthcare facilities should be immune to mumps
- If born in or after 1957 and with no history or evidence of immunity - 2 doses of live mumps virus vaccine recommended
  - If 1 dose previously, should receive a second dose
- If born before 1957 & no history or evidence of immunity – consider 1 dose

ACIP Changes – May 2006 Mumps Virus Vaccine

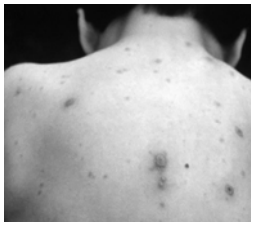
- Documentation of 2 doses of vaccine for school-age children, K-12, and adults at risk e.g., HCP, students at post-high school education facilities, international travelers
- Outbreak settings – If 1-4 yrs of age or low-risk adult with 1 dose, consider 2nd dose
- HCP during outbreak, strongly consider 2 doses vaccine to unvaccinated workers born before 1957 without evidence of mumps immunity.

Mumps Vaccine Strategies for HCP

- An effective MMR vaccination program prevents nosocomial transmission
- New recommendations offer increased protection during an outbreak
- Record review and vaccination of HCP during an outbreak may be impractical or inefficient
- Consider record review and vaccination for 2nd dose of mumps vaccine when completing other annual programs such as CPR or tuberculin testing

Varicella Disease Considerations:

- Varicella disease is highly communicable
- Birth before 1980 is only presumptive evidence of immunity and does not apply to healthcare personnel
- Can be severe in persons with altered immunocompetence



Risks of Hospital-Acquired Infection

- Varicella – transmitted in hospitals by patients, staff, and visitors.
- Varicella infection reported in 4 medical students; probable transmission during autopsy of infected patient

Varicella Immunity for HCP Definition

- HCP should have:
  - Serologic proof of immunity, OR
  - Prior vaccination with 2 doses, OR
  - 'Verified history of varicella disease", OR
  - History of herpes zoster (shingles)
- If not, give 2 doses of varicella vaccine,at least 4 weeks apart

What is "Verified History of Varicella Disease?"

- Typical disease - can be diagnosed by any healthcare provider
  - School or occupational nurse, nurse practitioner, physician assistant, physician
- Atypical and mild varicella cases - verified by physician or designee with one of these:
  - Epidemiologic link to typical case
  - Evidence of laboratory confirmation
- If no disease documentation, consider person susceptible
  - Other diseases mimic mild atypical varicella

ACIP Now Recommends Two Doses of Varicella Vaccine for All Ages

- Dose #1 at 12-15 months of age
- Dose #2 at 4-6 years of age
- If 12 months-12 years of age, separate two doses by 3 months
- If older than 13 yrs, separate the two doses by at least 4-8 weeks

Varicella Vaccine Rash Transmission

- Risk of transmission if vaccine rash develops, but risk is low
- Consider precautions if rash develops
  - Avoid contact with susceptible persons who are at risk for severe disease
  - Avoid contact until all lesions crusted over or fade away or no new lesions for 24 hours

Varicella Serology

- Prevaccination serologic screening to detect past disease is not necessary, but may be cost-effective
- Postvaccination testing should not be done – assays not adequately sensitive

Pertussis Paroxysmal Cough

Facts Related to Pertussis

- Adolescents and adults transmit pertussis to infants
- Pertussis immunity wanes in 5-10 years, both vaccine and disease immunity
- Historical underdiagnosis of adolescents and adults
- Increased awareness of pertussis disease leads to earlier and better diagnosis
- May have had incomplete immunization as a child

Pertussis Outbreaks

- Pertussis outbreaks are regularly documented in schools and healthcare settings
- Nosocomial spread of pertussis has been documented in various healthcare settings serving pediatric and adult patients
- Pertussis among HCP and patients can result in substantial morbidity
- Infants with nosocomial pertussis are at substantial risk

Pertussis in Infants

Smaller infants may be unable to "whoop" and will have apnea or respiratory distress symptoms

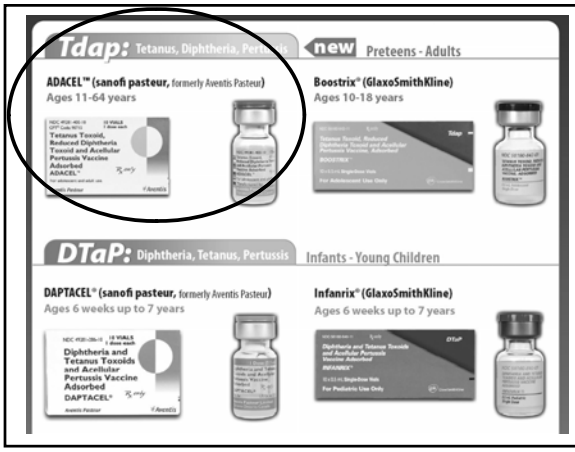
Pertussis in Healthcare Settings

- Numerous studies and case reports document pertussis transmission among HCP in healthcare settings
  - 1 infected infant – 17 HCP infected; 307 contacts treated
  - 1 infected HCP – 87 cases; 626 contacts
- HCP, patients, visitors have been the "source case" of pertussis in healthcare settings
- HCP immunity is essential for infection prevention and control efforts

Tdap Recommendation for HCP

- For HCP who provide direct patient care, ACIP recommends 1 dose of Tdap as soon as feasible;
- Prioritize Tdap vaccine to HCP who care for patients younger than 12 months of age

Are the mother, grandmother, nurse, and babysitter immune to pertussis?



Influenza Vaccine Recommendations for Healthcare Personnel

- Offer annual influenza vaccination to all HCP, including night and weekend staff
- Prioritize vaccination to HCP who care for high-risk groups
- Provide education to HCP about vaccine benefits and potential health consequences of influenza illness for patients, self, family
- Provide convenient access to influenza vaccine at the work site, free of charge

Risks of Influenza Outbreaks in Healthcare Settings

- Influenza transmission in healthcare settings is linked to unvaccinated HCP
- Long-term-care facility death rates are affected by influenza infection and HCP vaccination rates
- All healthcare personnel, employees in residences for persons at high risk of influenza, household contacts, home care-givers should be vaccinated annually

Table of Priority Groups for Inactivated Influenza Vaccine

TABLE. Priority groups for vaccination with inactivated influenza vaccine and estimated vaccination c

Tier		Priority group[†]	Population in 2003[§] (millions)	Estimat vaccinat coverage
1	A	Persons aged ≥65 years with comorbid conditions	18.2	70.9[¶]
		Residents of long-term-care facilities	1.7	80.0*
		Total	19.9	71.4
	B	Persons aged 2–64 years with comorbid conditions	42.4	34.9[¶]
		Persons aged ≥65 years without comorbid conditions	17.7	60.8[¶]
		Children aged 6–23 months	6.0	48.4[¶]
		Pregnant women	4.0	12.8[¶]
		Total	70.1	40.9
	C	Health-care personnel	7.0	40.1[¶]
		Household contacts and out-of-home caregivers of children aged <6 months	5.0	17.3[¶]
		Total	12.0	30.6
2		Household contacts of children and adults at increased risk for influenza-related complications	70.3	18.2[¶]
		Healthy persons aged 50–64 years	17.7	29.8[¶]
		Total	88.0	20.6
3		Persons aged 2–49 years without high-risk conditions	105.5	14.8[¶]

Priority Group 1C

HCP Transmission of Influenza

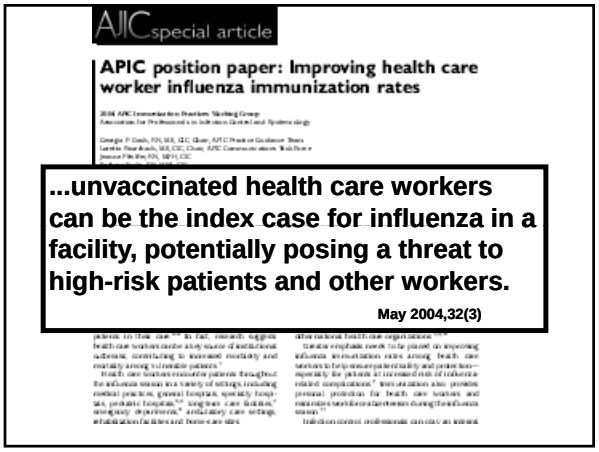
- Virus is shed one day before symptoms
- Some HCP are asymptomatic but still transmit virus to others
- Mild cases are still contagious
- HCP tend to work when ill
- 3 of 5 HCP put themselves, their families, patients at risk of infection

CDC

HCP Transmission of Influenza

- 23% HCP had serologic evidence of influenza infection after a mild influenza season;
  - 59% could not recall having influenza,
  - 28% could not recall any respiratory infection, suggesting a high proportion of asymptomatic illness
- Mortality rates were 42% lower among nursing home residents where staff had higher vaccination coverage

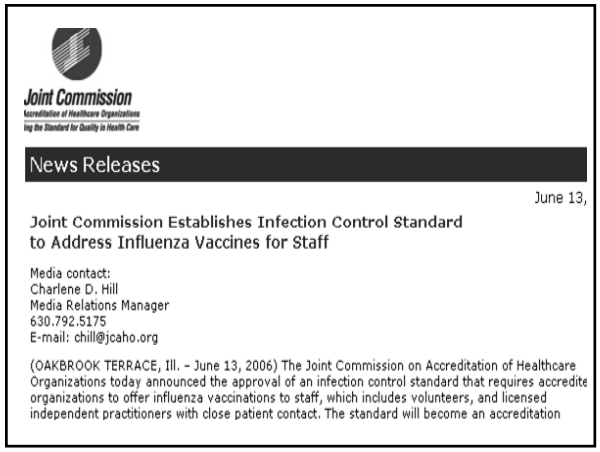
CDC


AJIC special article

APIC position paper: Improving health care worker influenza immunization rates

...unvaccinated health care workers can be the index case for influenza in a facility, potentially posing a threat to high-risk patients and other workers.

May 2004,32(3)


Joint Commission

Accreditation of Healthcare Organizations

Ing the Standard for Quality in Health Care

News Releases

June 13,

Joint Commission Establishes Infection Control Standard to Address Influenza Vaccines for Staff

Media contact:
Charlene D. Hill
Media Relations Manager
630.792.5175
E-mail: chill@jcaho.org

(OAKBROOK TERRACE, Ill. – June 13, 2006) The Joint Commission on Accreditation of Healthcare Organizations today announced the approval of an infection control standard that requires accredite organizations to offer influenza vaccinations to staff, which includes volunteers, and licensed independent practitioners with close patient contact. The standard will become an accreditation

JCAHO Standard Requirements

- Establish an annual influenza vaccination program that includes at least staff and licensed independent practitioners
- Provide access to influenza vaccinations on-site
- Educate staff and licensed independent practitioners about flu vaccination; nonvaccine control measures (precautions); and diagnosis, treatment, and potential impact of influenza
- Annually evaluate vaccination rates and reasons for non-participation in the organization's immunization program
- Implement enhancements to the program to increase participation

Influenza Vaccine for HCP

- Inactivated influenza vaccine contains only noninfectious fragments of influenza virus. It is given intramuscularly.
- Nasal spray is a live, attenuated vaccine and does not replicate systemically.
- Healthcare personnel can receive LAIV
- Influenza vaccines cannot cause influenza disease.
- It takes about 2 weeks for the vaccine to become fully effective

CDC

Live Attenuated Influenza Vaccine

- Healthy persons younger than 50 years of age can receive LAIV
- Eligible HCP should use LAIV
- Noneligible HCP can administer LAIV (e.g., those who are diabetic, asthmatic, pregnant)

CDC

Influenza Vaccination of Health Care Workers

Excuse:
"Influenza vaccine always gives me the flu…"

CDC

Influenza Vaccine Adverse Reactions

Local reactions-TIV	15%-20%
Fever, malaise	uncommon
Allergic reactions	rare
Neurological reactions	very rare
Inactivated (TIV)	NEVER causes flu
LAIV	Won't cause flu

CDC

Influenza Vaccination of HCWs

Excuse:
"Influenza vaccine doesn't work…"

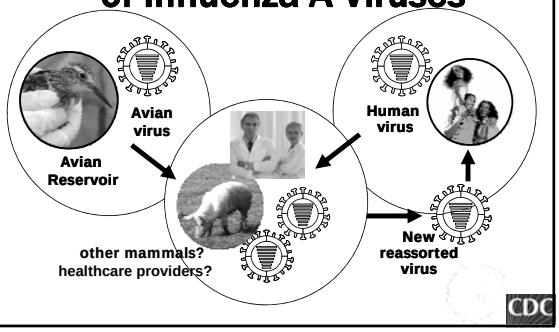
CDC

Influenza Vaccine Benefits Healthcare Personnel

- 28% fewer lost work days due to respiratory infections
- 28% fewer days HCP felt unable to work
- Lower incidence of influenza, 1.7%; compared to controls 13.4%
- Fewer respiratory illnesses than controls; 28.7 vs. 40.6 per 100 persons
- Fewer days of lost work than control groups; 9.9 vs. 21.1 per 100 persons

CDC

Pandemic Strain Emergence: Reassortment of Influenza A Viruses



CDC

Healthcare Personnel Vaccination Recommendations

Vaccine	Recommendations in Brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1-2 months after dose #3
Influenza	Give 1 dose of TIV or LAIV annually. Give TIV intramuscularly or LAIV intranasally.
MMR	HCP born in 1957 or later without evidence of immunity or prior vaccination, give 2 doses MMR, 4 weeks apart. Give SC. If born before 1957, 1 dose. Two doses for all HCP during mumps outbreak.
Varicella	HCP with no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus/diph-theria/ acellular pertussis	All HCP need Td every 10 years after completing a primary series. Give 1 dose of Tdap IM, if direct patient contact, prioritize HCP in contact with pts. <12 mos.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of *N. meningitidis*.

http://www.immunize.org/catg.d/p2017.pdf

Immunization Contact Information

National Center for Immunization and Respiratory Diseases - NCIRD

- Hotline 800.CDC.INFO
  800-232-4636
- Email nipinfo@cdc.gov
- Website www.cdc.gov/vaccines

MMWR™

Morbidity and Mortality Weekly Report

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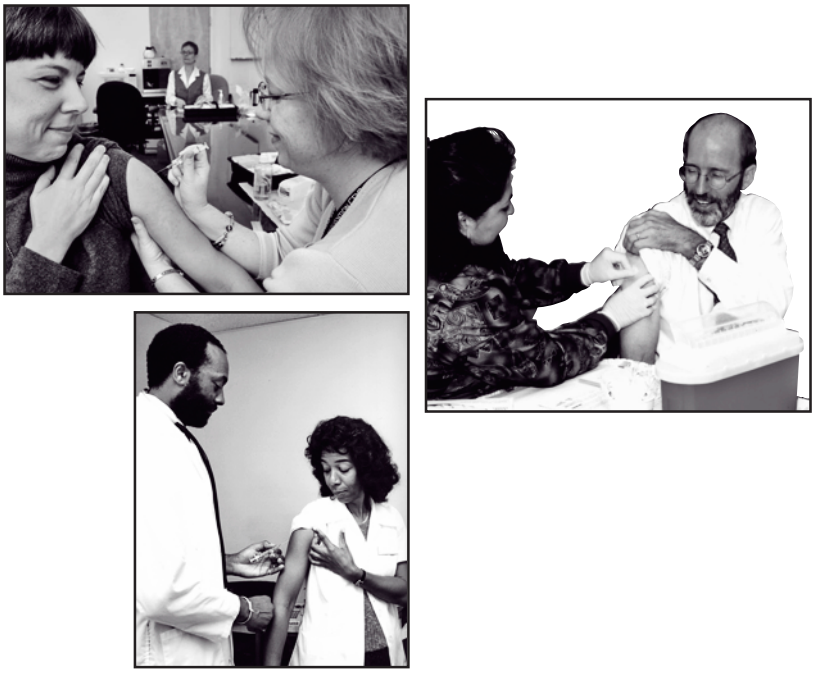
Influenza Vaccination of Health-Care Personnel

Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP)



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

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Influenza Vaccination of Health-Care Personnel

Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP)

Prepared by
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Summary

This report summarizes recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP) concerning influenza vaccination of health-care personnel (HCP) in the United States. These recommendations apply to HCP in acute care hospitals, nursing homes, skilled nursing facilities, physician's offices, urgent care centers, and outpatient clinics, and to persons who provide home health care and emergency medical services. The recommendations are targeted at health-care facility administrators, infection-control professionals, and occupational health professionals responsible for influenza vaccination programs and influenza infection-control programs in their institutions. HICPAC and ACIP recommend that all HCP be vaccinated annually against influenza. Facilities that employ HCP are strongly encouraged to provide vaccine to their staff by using evidence-based approaches that maximize vaccination rates.

Introduction

Influenza transmission and outbreaks in hospitals (*1–8*) and nursing homes (*9–13*) are well documented. HCP can acquire influenza from patients or transmit influenza to patients and other staff. Despite the documented benefits of HCP influenza vaccination on patient outcomes (*14,15*) and HCP absenteeism (*16*) and on reducing influenza infection among staff (*16,17*), vaccination coverage among HCP remain low (i.e., <50%) (*18*). Because HCP provide care to patients at high risk for complications of influenza, HCP should be considered a high priority for expanding influenza vaccine use. In addition, older HCP (i.e., aged ≥65 years) and those who have underlying chronic medical conditions or who might be pregnant are at increased risk for influenza-related complications. Achieving and sustaining high vaccination coverage among HCP will protect staff and their patients, and reduce disease burden and health-care costs.

This report summarizes recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP) concerning influenza vaccination of health-care personnel (HCP)* in the United States. These recommendations are targeted at health-care facility administrators, infection control professionals, and occupational health professionals responsible for influenza vaccination programs and influenza infection control programs in their institutions. HICPAC and ACIP recommend that all HCP be vaccinated annually against influenza. Facilities that employ HCP are strongly encouraged to provide vaccine to their staff by using

The material in this report originated in the National Center for Infectious Diseases, Rima F. Khabbaz, MD, Director; Division of Healthcare Quality Promotion, Denise M. Cardo, MD, Director; Division of Viral and Rickettsial Diseases, Steve Monroe, PhD, Acting Director; and National Immunization Program, Anne Schuchat, MD, Director; Epidemiology and Surveillance Division, Alison Mawle, PhD, Acting Director.
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* In this report, the term HCP refers to all paid and unpaid persons working in health-care settings who have the potential for exposure to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. HCP might include (but are not limited to) physicians, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual staff not employed by the health-care facility, and persons (e.g., clerical, dietary, housekeeping, maintenance, and volunteers) not directly involved in patient care but potentially exposed to infectious agents that can be transmitted to and from HCP. The recommendations in this report apply to HCP in acute care hospitals, nursing homes, skilled nursing facilities, physician's offices, urgent care centers, and outpatient clinics, and to persons who provide home health care and emergency medical services.

evidence-based approaches that maximize vaccination rates. This report supplements ACIP's previous statement regarding use of influenza vaccine and antiviral agents (*1*), which provides details regarding the epidemiology of influenza transmission in nonhealth-care settings, influenza vaccination of nonhealth-care personnel, composition of influenza vaccines, and use of antiviral medications.

Summary Recommendations

The summary recommendations contained in this report are categorized by using the HICPAC evidence ranking system (Table 1). The recommendations were drafted after review of peer-reviewed scientific articles, and whenever possible are based on well-designed studies; certain recommendations are based on strong theoretic rationale and expert opinion. All recommendations have been approved by HICPAC and ACIP. The committees involved in drafting and reviewing these recommendations included persons with expertise in infectious diseases, infection control, pediatrics, vaccinology, internal medicine, and public health. The recommendations are as follows:

- Educate HCP regarding the benefits of influenza vaccination and the potential health consequences of influenza illness for themselves and their patients, the epidemiology and modes of transmission, diagnosis, treatment, and nonvaccine infection control strategies, in accordance with their level of responsibility in preventing health-care–associated influenza (category IB).
- Offer influenza vaccine annually to all eligible HCP to protect staff, patients, and family members and to decrease HCP absenteeism. Use of either available vaccine (inactivated and live, attenuated influenza vaccine [LAIV]) is recommended for eligible persons. During periods when inactivated vaccine is in short supply, use of LAIV is especially encouraged when feasible for eligible HCP (category IA).
- Provide influenza vaccination to HCP at the work site and at no cost as one component of employee health programs. Use strategies that have been demonstrated to increase influenza vaccine acceptance, including vaccination clinics, mobile carts, vaccination access during all work shifts, and modeling and support by institutional leaders (category IB).
- Obtain a signed declination from HCP who decline influenza vaccination for reasons other than medical contraindications (category II).
- Monitor HCP influenza vaccination coverage and declination at regular intervals during influenza season and provide feedback of ward-, unit-, and specialty-specific rates to staff and administration (category IB).
- Use the level of HCP influenza vaccination coverage as one measure of a patient safety quality program (category II).

Background

Influenza Among HCP

A limited number of prospective and cross-sectional studies provide estimates of incidence of influenza and influenza-like illness (ILI) among HCP (*17,19,20*). In one serosurvey of HCP, 23% of HCP had documented serologic evidence of influenza infection after a mild influenza season; however, of these, 59% could not recall having influenza, and 28% could not recall any respiratory infection, suggesting a high proportion of asymptomatic illness (*17*). In a randomized trial of influenza vaccine among HCP, 13% of placebo recipients subsequently had influenza infection (*18*). In a cross-sectional survey of house staff, 37% reported ILI during an 8-month period (September–April); 9% reported more than one illness. Length of illness varied (range: 1–10 days; mean: 7 days), as did the number of days of work missed (range: 0–10 days; mean: 0.7 days) (*20*).

Efficacy and Effectiveness of Influenza Vaccines Among Adults

Trivalent inactivated influenza vaccine prevents influenza illness among approximately 70%–90% of healthy adults aged <65 years when the vaccine and circulating viruses are anti-

TABLE 1. Healthcare Infection Control Practices Advisory Committee categorization scheme for recommendations*

Category IA	Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.
Category IB	Strongly recommended for implementation and supported by certain experimental, clinical, or epidemiologic studies and a strong theoretic rationale.
Category IC	Required for implementation, as mandated by federal or state regulation or standard.
Category II	Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretic rationale.
No recommendation	Unresolved issue; practices for which insufficient evidence or no consensus regarding efficacy exist.

* Categorized on the basis of existing scientific data, theoretic rationale, applicability, and economic impact.

genically similar (*17,21–23*). The effectiveness of inactivated influenza vaccine in preventing influenza illness might be lower when vaccine and circulating viruses are not well matched or among adults aged ≥65 years and persons with certain chronic conditions (e.g., diabetes, human immunodeficiency virus (HIV), or chronic obstructive pulmonary disease) (*24–28*). Vaccination of healthy adults also decreases work absenteeism and use of health-care resources, including antibiotics, when the vaccine and circulating viruses are well matched (*17,21, 23,29–31*). In addition, influenza vaccine prevents secondary complications and reduces the risk for influenza-related hospitalization and death among adults aged ≥65 years with and without high-risk medical conditions (e.g., heart disease and diabetes) (*32–36*).

LAIV has demonstrated similar benefits in randomized controlled trials among healthy working adults aged 18–64 years. In one study, vaccination with LAIV reduced severe febrile illnesses 19% and upper respiratory tract illnesses 24%; LAIV use also was associated with fewer days of illness and of work lost, fewer health-care provider visits, and reduced use of prescription antibiotics and over-the-counter medications (*37*). These results were recorded during a season in which the vaccine and circulating influenza A (H3N2) strains were not well matched. In the same study, LAIV vaccination yielded similar benefits among a subset of healthy adults aged 18–49 years, and antibiotic use in this age group decreased 41%–51% (*37*). In one study, overall efficacy of LAIV and inactivated influenza vaccine in preventing laboratory-documented influenza was 85% and 71%, respectively (*38*).

Impact of HCP Vaccination on Influenza in Health-Care Settings

Vaccination of HCP is an important component of influenza prevention programs in the United States (*18*). Vaccination of HCP reduces transmission of influenza in health-care settings, staff illness and absenteeism, and influenza-related morbidity and mortality among persons at increased risk for severe influenza illness (*14–17*). Use of antiviral drugs used for chemoprophylaxis or treatment of influenza is an adjunct to (but not a substitute for) vaccination (*18*).

Transmission of Influenza in Health-Care Settings

Influenza outbreaks in hospitals (*4,39*) and long-term–care facilities (*40*) have been associated with low vaccination rates among HCP. In addition, higher vaccination levels among staff have been associated with a lower incidence of nosocomial influenza cases (*14,15,39*).

In one tertiary care facility in which routine surveillance for influenza was conducted, the relation between staff vaccination coverage and annual incidence of nosocomial influenza was assessed for 12 influenza seasons during 1987–2000. During this period, staff vaccination coverage increased from 4% during 1987–1988 to 67% during 1999–2000 ($p<0.0001$), and the proportion of laboratory-confirmed cases of influenza that occurred among HCP decreased from 42% during 1990–1993 to 9% during 1997–2000 ($p<0.0001$). The proportion of nosocomial cases among hospitalized patients decreased 32% to 0 ($p<0.0001$). After controlling for potential confounders by using logistic regression, a significant and inverse relationship was demonstrated between vaccination rates among HCP and the rate of nosocomial influenza among patients, suggesting that staff vaccination contributed to the observed decline in the number of nosocomial influenza cases (*39*).

Staff Illness and Absenteeism

During an influenza season, HCP might acquire influenza from infected patients with resulting morbidity and absenteeism. The impact of influenza vaccination on staff illness and absenteeism has been evaluated in two randomized, placebo-controlled, double-blind trials. In one trial, HCP who received vaccine had 28% fewer documented lost work days attributable to respiratory infections (1.0 and 1.4, respectively; $p = 0.02$) and 28% fewer days on which they felt unable to work, whether they were on or off duty (2.5 and 3.5, respectively; $p = 0.02$). Vaccination did not reduce either the number of episodes (1.8 and 2.0, respectively) or the total number of days (13.5 and 14.6, respectively) of respiratory infection (*16*). In a second trial conducted in two large teaching hospitals for 3 consecutive years that measured serologically confirmed influenza, days of febrile respiratory illness, and days absent from work, HCP who received influenza vaccine had a substantially lower incidence of influenza than controls (1.7% and 13.4%, respectively) with an estimated vaccine efficacy against serologically defined influenza A and influenza B infection of 88% and 89%, respectively. HCP who received influenza vaccine also tended to have fewer total respiratory illnesses (28.7 and 40.6 per 100 persons, respectively; $p = 0.57$) and days of lost work (9.9 and 21.1 per 100 persons, respectively; $p = 0.41$) than did controls (*17*).

In a cross-sectional survey, similar reductions in staff illness episodes and days of illness were reported (*20*). Overall, compared with unvaccinated coworkers, vaccinated house staff reported 23% fewer ILIs (42 and 54 per 100 persons, respectively; $p = 0.03$), 27% fewer days of illness (80 and 115 per 100 persons, respectively; $p = 0.02$), and a 59% reduction in illness during vacation time (1.7% and 4.0% of persons,

respectively; p = 0.08). The two groups had a similar number of lost work days attributable to ILI (18 and 21 per 100 subjects, respectively; p = 0.69). During influenza season, vaccination was associated with reductions of 30% in ILI (p = 0.05), 43% in the proportion of house staff reporting illnesses associated with fever and cough (p = 0.05), and 63% in illnesses associated with fever and cough (p = 0.03). The inability to consistently demonstrate statistically significant decreases in absenteeism among staff who received vaccination is likely attributable to the finding that HCP tend to work despite illness (*17,41*).

Patient Outcomes

HCP who are clinically or subclinically infected can transmit influenza virus to other persons. Decreasing transmission of influenza from caregivers to persons at high risk might reduce influenza-related deaths among persons at high risk for complications from influenza.

Residents of long-term–care facilities are particularly vulnerable to influenza and influenza-related complications. In1999, an estimated 1.6 million persons resided in nursing homes in the United States (*42*). During influenza outbreaks in long-term–care facilities, attack rates among residents have ranged as high as 25%–60%, with case-fatality rates of 10%–20% (*13,43–45*). When vaccine and epidemic strains are well matched, achieving increased vaccination rates among persons living in closed settings (e.g., nursing homes and other chronic-care facilities) and among staff can reduce the risk for outbreaks by inducing herd immunity (*32*).

Two randomized controlled trials have evaluated the impact of influenza vaccination of HCP on the outcomes of residents in nursing homes. In one study, staff vaccination was associated with a 43% decrease in incidence of ILI (odds ratio [OR] = 0.6; 95% confidence interval [CI] = 0.3–0.9) and a 44% decrease in overall mortality among facility residents, from 17% to 10% (OR = 0.6; 95% CI = 0.4–0.8) (*15*). No virologic data were provided in this study. In a second study, 20 long-term–care facilities were randomized to have vaccine routinely offered (intervention facilities) or not offered (control facilities) to their staff (*14*). Facilities were paired by number of beds and patient vaccination policies. Staff vaccination coverage was higher in intervention facilities than in control facilities (50.9% and 4.9%, respectively). Crude mortality rates were 42% lower among residents in facilities with higher staff vaccination coverage than those in control facilities (13.6% and 22.4%, respectively; OR = 0.6; 95% CI = 0.4–0.8; p = 0.014). Incidence of laboratory-confirmed influenza did not differ between the two groups (5.4% and 6.7%, respectively), but postmortem samples from patients in control facilities were more likely to be positive for influenza by a polymerase chain reaction test than samples from patients in intervention facilities (six [20%] of 30 and none of 17, respectively; p = 0.055), suggesting that in this study population, HCP vaccination reduced influenza-related mortality in patients despite not reducing the incidence of non-fatal influenza infection. In neither study was a significant association demonstrated between patient vaccination and mortality. Randomized trials assessing the impact of staff vaccination on patient outcomes in acute care facilities have not been conducted, but low staff vaccination coverage has been correlated with influenza outbreaks in hospitals (*4,39*).

Cost-Effectiveness of Influenza Vaccine

Cost-effectiveness studies of adults aged <65 years indicate that vaccination can reduce both direct medical costs and indirect costs from work absenteeism (*21,23,29,30,46,47*), resulting in 13%–44% fewer health-care provider visits, 18%–45% fewer lost workdays, 18%–28% fewer days working with reduced effectiveness, and a 25% decrease in antibiotic use for ILI (*21,29,48,49*). Among healthy persons aged 18–64 years, vaccination can save an estimated $60–$4,000 per illness, depending on the cost of vaccination, the influenza attack rate, and vaccine effectiveness against ILI (*23*). In another economic analysis, vaccination resulted in an average annual cost savings of $13.66 per person vaccinated (*50*); however, other analyses have not demonstrated cost savings (*21*). Among studies of healthy young adults, >70% of the costs prevented were associated with reductions in lost work productivity.

Vaccination Coverage Levels Among HCP

During 1989–2003, HCP vaccination coverage levels in the United States increased substantially, from 10% to 40%; however, coverage levels have remained relatively constant since 1997 (*18*). One of the national health objectives for 2010 is to achieve HCP vaccination coverage levels of 60% (objective no. 14-29g) (*51*). Substantially lower vaccination rates have been reported among HCP who have contact with certain populations at high risk (*12,52–54*). In addition, HCP vaccination coverage varies by level and years of training, age, occupational group, and facility type (*20,55,56*).

Barriers to HCP Vaccination

Reported barriers to HCP receipt or acceptance of influenza vaccination include fear of vaccine side effects (particularly ILI symptoms) (*20,55,57–61*), insufficient time or

inconvenience (*20*), perceived ineffectiveness of the vaccine (*20,55,58,59*), medical contraindication (*55*), perceived low likelihood of contracting influenza (*55,60,62*), reliance on treatment with homeopathic medications (*55,62*), avoidance of medications (*57*), and fear of needles (*57,59*). Factors facilitating vaccine acceptance include a desire for self-protection (*20,58,61*), previous receipt of influenza vaccine (*57,58,63–65*), a desire to protect patients (*61*), and perceived effectiveness of vaccine (*20*).

Strategies for Improving HCP Vaccination Rates

Facilities that employ HCP are strongly encouraged to provide vaccine to staff by using evidence-based approaches that maximize vaccination rates. Successful HCP vaccination programs are multifaceted and combine publicity and education to combat fears and misconceptions about influenza and influenza vaccines, use of reminder recall systems, efforts to remove administrative and financial barriers, role modeling, and monitoring and feedback on vaccination coverage (*66*). In contrast, single-component interventions will likely have minimal effectiveness in achieving desired vaccination coverage levels (*66,67*).

Education and Campaigns

HCP knowledge, perceptions, and attitudes regarding influenza and influenza vaccination vary (*20*). Basic knowledge about influenza and influenza vaccination has been associated with vaccine receipt (*57,68,69*), and participation in structured in-service education or conferences has been associated with improved vaccination rates (*62,65*). Educational programs should emphasize the benefits of HCP vaccination for staff and patients (*70*). Organized campaigns that promote and make vaccine accessible can improve vaccination rates among HCP (*52,71*).

Role Models

Vaccination of senior medical staff or opinion leaders has been associated with higher vaccination acceptance among staff members under their leadership (*55,69,72,73*). For example, medical students who have contact with infectious disease specialists are more likely to be vaccinated (*69*).

Improved Access

Removing administrative barriers (e.g., costs) (*71*) and providing vaccine in locations and at times easily accessible by HCP can substantially improve vaccine acceptance (*40,52,55,72,74,75*). In one survey, 33% of HCP reported that they would reject vaccination if they were required to pay for the vaccine (*76*).

Making vaccine readily accessible at congregate areas (e.g., clinics), during conferences, or by use of mobile carts (*40,52,55,72*) has been demonstrated to improve vaccination coverage rates. Use of mobile carts has been associated with increased vaccine acceptance during outbreaks and nonoutbreak situations (*75,76*) . In a 3-year prospective study in a 630-bed acute care hospital, a sustained four- to fivefold increase in vaccination rates was associated with using mobile carts to deliver vaccine to staff rather than requiring HCP to visit an employee health center to receive vaccine. Provision of modest incentives also has been associated with improved vaccine acceptance among HCP (*77*). However, the benefits of vaccine deputies or peer-vaccinators have not been consistently associated with improved HCP vaccination (*52*).

Measurement and Feedback

HCP influenza vaccination coverage should be regularly measured and reported. Posting of vaccination coverage levels in different areas of the hospital is a component of successful vaccination programs (*6*). Monitoring vaccination coverage by facility area (e.g., ward or unit) or occupational group allows facilities to identify where vaccination levels are low and interventions should be targeted. In addition, HICPAC has recommended that HCP influenza vaccination coverage be used as a health-care quality measure in those states that mandate public reporting of health-care–associated infections (*78*).

The independent contribution of signed declination statements to improving HCP vaccination has not been studied. However, obtaining declination statements from HCP who refuse vaccination for reasons other than medical contraindications can assist facilities in identifying personnel who might require targeted education or other interventions to overcome barriers to vaccine acceptance. In addition, collection of such information will allow health-care facilities to determine what proportion of their staff are reached and offered vaccine.

Legislation and Regulation

Legislative and regulatory efforts have favorably affected hepatitis B vaccination rates among HCP (*79,80*). As of January 2005, a total of 13 states (Alabama, Arkansas, Kentucky, Maine, Maryland, New Hampshire, New York, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, and Utah) and the District of Columbia were reported to have enacted regulations regarding influenza vaccination of staff in long-term–care facilities (*67,81*). However, because only one state

(Pennsylvania) has monitored the impact of its laws on nursing home staff vaccination rates, data are insufficient to assess the overall impact of these legislative efforts on HCP influenza vaccination coverage (CDC, unpublished data, 2005).

Recommendations for Using Inactivated Influenza Vaccine and LAIV Among HCP

All HCP should be vaccinated annually against influenza. Either inactivated influenza vaccine or LAIV can be used to reduce the risk for influenza among HCP (Table 2). LAIV is approved for use only among nonpregnant healthy persons aged 5–49 years. HCP who work with severely immunocompromised patients who require a protected environment should not receive LAIV. Inactivated influenza vaccine is approved for all persons aged >6 months who lack vaccine contraindications, including those with high-risk conditions (see Recommendations for Prioritization of Influenza Vaccine During the 2005–06 Influenza Season). Four influenza vaccines have been approved for use in the United States during the 2005–06 season (Table 3).

Inactivated Influenza Vaccine Recommendations

Dosage and Route

Because immunity declines during the year after vaccination, HCP eligible to receive inactivated influenza vaccine should be administered 1 dose of the current year's vaccine each year (*82,83*). The intramuscular route is recommended for inactivated influenza vaccine. Adults should be vaccinated in the deltoid muscle, ideally by using a needle of length >1 inch because needles of length <1 inch might not penetrate muscle tissue in certain adults (*84*).

Persons Who Should Not Be Vaccinated with Inactivated Influenza Vaccine

Inactivated influenza vaccine should not be administered to persons known to have anaphylactic hypersensitivity to eggs or to other components of the influenza vaccine without first consulting a physician (see Side Effects and Adverse Reactions Associated with Vaccination). Prophylactic use of antiviral agents is an option for preventing influenza among such persons. However, persons who have a history of anaphylactic

TABLE 2. Live, attenuated influenza vaccine (LAIV) compared with trivalent inactivated influenza vaccine

Factor	LAIV	Trivalent inactivated influenza vaccine
Route of administration	Intranasal spray	Intramuscular injection
Type of vaccine	Live virus	Killed virus
No. of included virus strains	3 (2 influenza A, 1 influenza B)	Same as LAIV
Vaccine virus strains updated	Annually	Same as LAIV
Frequency of administration	Annually	Same as LAIV
Approved age and risk groups*	Healthy persons aged 5–49 yrs	Persons aged ≥6 mos
Can be administered to family members or close contacts of immunosuppressed persons not requiring a protected environment	Yes	Yes
Can be administered to family members or close contacts of immunosuppressed persons requiring a protected environment (e.g., hematopoietic stemcell transplant recipient)	Inactivated influenza vaccine preferred	Yes
Can be administered to family members or close contacts of persons at high risk but not severely immunosuppressed	Yes	Yes
Can be simultaneously administered with other vaccines	Yes†	Yes§
If not simultaneously administered, can be administered within 4 weeks of another live vaccine	Prudent to space 4 weeks apart	Yes
If not simultaneously administered, can be administered within 4 weeks of an inactivated vaccine	Yes	Yes

* Populations at high risk from complications of influenza infection include persons aged ≥65 years; residents of nursing homes and other chronic-care facilities that house persons with chronic medical conditions; adults and children with chronic disorders of the pulmonary or cardiovascular systems; adults and children with chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunnosuppression; children and adolescents receiving long-term aspirin therapy (at risk for Reye syndrome after wild-type influenza infection); pregnant women; and children aged 6–23 months.
† No data are available regarding effect on safety or efficacy.
§ Inactivated influenza vaccine coadministration has been evaluated systematically only among adults with pneumococcal polysaccharide vaccine.

TABLE 3. Influenza vaccine manufacturers and projected supplies for the 2005–06 influenza season

Manufacturer	Vaccine	Formulation	Contains thimerosal as preservative	Age indication	No. of projected doses*
Sanofi Pasteur, Inc.	Fluzone®†	Multidose vial	Yes	≥6 mos	60 million§
		Single-dose prefilled 0.5-mL syringe or vial	No	≥36 mos	
		Single-dose prefilled 0.25-mL syringe	No	6–35 mos	
Chiron Corporation	Fluvirin™†	Multidose vial	Yes	≥4 yrs	18–26 million
		Single-dose prefilled 0.5-mL syringe	No¶	≥4 yrs	
GlaxoSmithKline, Inc.	Fluarix™†	Single-dose prefilled 0.5-mL syringe	No¶	≥18 yrs	8 million
MedImmune Vaccines, Inc.	FluMist™**	Single-dose nasal sprayer	No	Healthy, nonpregnant persons aged 5–49 yrs	3 million

* As of August 2005.
† Trivalent inactivated influenza vaccine.
§ Approximately 6–8 million of the 60 million doses were projected to be distributed in single-dose prefilled syringes or vials.
¶ These preparations contain traces of thimerosal from the production process.
** Live, attenuated influenza vaccine.

hypersensitivity to vaccine components but who are also at high risk for complications from influenza can benefit from vaccine after appropriate allergy evaluation and desensitization (*18*). Information regarding vaccine components is located in package inserts from each manufacturer. Persons with acute febrile illness typically should not be vaccinated until their symptoms have abated. However, minor illnesses with or without fever do not contraindicate use of influenza vaccine.

LAIV Recommendations

LAIV licensed for use in the United States (FluMist™ manufactured by MedImmune, Inc., Gaithersburg, Maryland [http//www.medimmune.com]) is a live, trivalent, intranasally administered vaccine that is

- attenuated, producing mild or no signs or symptoms related to influenza virus infection;
- temperature-sensitive, a property that limits the replication of the vaccine viruses at 100.4°–102.2° F (38° C–39° C) and thus restricts LAIV viruses from replicating efficiently in human lower airways; and
- cold-adapted, replicating efficiently at 77° F (25° C), a temperature that is permissive for replication of LAIV viruses but restrictive for replication of different wild-type viruses.

The immunogenicity of the approved LAIV has been assessed in multiple studies (*85–91*). LAIV virus strains replicate primarily in nasopharyngeal epithelial cells. The protective mechanisms induced by vaccination with LAIV are not completely understood but appear to involve both serum and nasal secretory antibodies. No single laboratory measurement closely correlates with protective immunity induced by LAIV.

Shedding and Transmission of Vaccine Viruses

One concern regarding use of LAIV among HCP has been the potential for transmitting vaccine virus from persons receiving vaccine to nonimmune patients at high risk. Available data indicate that children and adults vaccinated with LAIV can shed vaccine viruses for >2 days after vaccination, although in lower titers than typically occur with shedding of wild-type influenza viruses. Shedding should not be equated with person-to-person transmission of vaccine viruses, although transmission of shed vaccine viruses from vaccinated persons to nonvaccinated persons has been documented in rare instances among children in a day care center (*92*).

In one study of 20 healthy vaccinated adults aged 18–49 years, the majority of vaccine virus shedding occurred within the first 3 days after vaccination, although in one vaccinated person, viral shedding was detected on day 7 after vaccination (*93*). No vaccine viruses were shed >10 days after vaccination, and duration or type of symptoms associated with receipt of LAIV did not correlate with duration of shedding of vaccine viruses (*93*). In another study of 14 healthy adults aged 18–49 years, 50% of vaccinated persons had viral antigen detected by direct immunofluorescence or rapid antigen tests within 7 days of vaccination; the majority of viral shedding was detected on day 2 or 3 (*94*). Person-to-person transmission of vaccine viruses was not assessed in either of these studies.

One study conducted in a child care center assessed transmissibility of vaccine viruses from 98 vaccinated persons to 99 unvaccinated controls aged 8–36 months; 80% of vaccine recipients shed one or more virus strains (mean duration: 7.6 days). One influenza type B isolate was recovered from a placebo recipient and confirmed to be vaccine-type virus; the

isolate retained the cold-adapted, temperature-sensitive, attenuated phenotype and possessed the same genetic sequence as a virus shed from a vaccine recipient in the same children's play group. The placebo recipient from whom the influenza type B vaccine virus was isolated exhibited symptoms that were similar to those experienced by vaccine recipients. The estimated probability of acquiring vaccine virus after close contact with a single LAIV recipient in this child care population was 0.6%–2.4% (*92*).

Using LAIV for HCP

LAIV may be used for vaccination of healthy, nonpregnant persons aged 5–49 years, including HCP. When feasible, use of LAIV for vaccination of eligible HCP is especially encouraged during periods of limited supply of inactivated influenza vaccine because use of LAIV for HCP might increase availability of inactivated influenza vaccine for persons at high risk. Use of LAIV also provides an alternative vaccine strategy for HCP who avoid influenza vaccination because of an aversion to intramuscular injections.

Persons Who Should Not Receive LAIV

The following populations should not receive LAIV:

- persons aged <5 years or >50 years;†
- persons with asthma, reactive airways disease or other chronic disorders of the pulmonary or cardiovascular systems; persons with other underlying medical conditions, including metabolic diseases such as diabetes, renal dysfunction, and hemoglobinopathies; or persons with known or suspected immunodeficiency diseases or who are receiving immunosuppressive therapies;†
- children or adolescents receiving aspirin or other salicylates (because of the association of Reye syndrome with wild-type influenza infection);†
- persons with a history of Guillain-Barré syndrome (GBS);
- pregnant women;†
- persons who have close contact with severely immunosuppressed persons (e.g., patients with hematopoietic stem cell transplants) during those periods in which the immunosuppressed person requires care in a protective environment; or
- persons with a history of hypersensitivity, including anaphylaxis, to any of the components of LAIV or to eggs.

LAIV Dosage and Administration

Eligible HCP should receive 1 dose of LAIV. LAIV is intended only for intranasal administration and should not be administered by the intramuscular, intradermal, or intravenous route. Administration can be accomplished by holding an individual sprayer in the palm of the hand until thawed, with subsequent immediate administration. Alternatively, the vaccine can be thawed in a refrigerator and stored at 35.6° F–46.4° F (2° C–8° C) for ≤60 hours before use. Vaccine should not be refrozen after thawing. LAIV is supplied in a prefilled single-use sprayer containing 0.5 mL of vaccine. Approximately 0.25 mL is sprayed into the first nostril while the recipient is in the upright position. An attached dose-divider clip is removed from the sprayer to administer the second half of the dose into the other nostril. If the vaccine recipient sneezes after administration, the dose should not be repeated.

LAIV may be administered to persons with minor acute illnesses (e.g., diarrhea or mild upper respiratory tract infection, with or without fever). However, if clinical judgment indicates the presence of nasal congestion that might impede delivery of vaccine to the nasopharyngeal mucosa, deferral of administration should be considered until resolution of the illness.

Whether concurrent administration of LAIV with other vaccines affects the safety or efficacy of either LAIV or the simultaneously administered vaccine is unknown. In the absence of specific data indicating interference, adherence to ACIP's general recommendations for vaccination is prudent (*95*). Inactivated vaccines do not interfere with the immune response to other inactivated vaccines or to live vaccines. An inactivated vaccine can be administered either simultaneously or at any time before or after LAIV. Whenever possible, two live vaccines not administered on the same day should be administered >4 weeks apart.

Recommended Vaccines for HCP Who Have Close Contact with Severely Immunosuppressed Persons

Inactivated influenza vaccine is the preferred vaccine for use among HCP who have close contact with severely immunosuppressed persons (e.g., patients with hematopoietic stem cell transplants) during those periods in which the immunosuppressed person requires care in a protective environment. The rationale for not using LAIV among HCP caring for such patients is the theoretic risk that a live, attenuated vaccine virus could be transmitted to the severely immunosuppressed person. HCP who receive LAIV should refrain from contact with severely immunosuppressed patients for 7 days after vaccine receipt. In addition, visitors who have received LAIV should refrain from contact with severely immunosuppressed persons for 7 days after vaccination; however, such persons need not be excluded from visitation of patients who are not

† These persons should receive inactivated influenza vaccine.

severely immunosuppressed. Either inactivated influenza vaccine or LAIV can be used to vaccinate HCP who have close contact with persons with lesser degrees of immunosuppression (e.g., persons with diabetes, persons with asthma taking corticosteroids, or persons infected with human immunodeficiency virus) or who are in close contact with all other persons at high risk.

Personnel Who May Administer LAIV

The risk of acquiring vaccine viruses from the environment is unknown but likely small. Nevertheless, severely immunosuppressed persons should not administer LAIV because introduction of low levels of vaccine virus into the environment probably cannot be avoided when administering LAIV. However, other persons with conditions placing them at high risk for influenza complications (e.g., pregnant women, persons with asthma, and persons aged >50 years) may administer LAIV.

LAIV and Use of Influenza Antiviral Medications

How LAIV coadministration with influenza antiviral medications affects safety and efficacy has not been studied. However, because influenza antivirals reduce replication of influenza viruses, LAIV should not be administered until 48 hours after cessation of influenza antiviral therapy, and influenza antiviral medications should not be administered for 2 weeks after receipt of LAIV.

LAIV Storage

~~LAIV must be stored at -59° F (-15° C) or colder. LAIV may be stored in frost-free freezers without using a freezer box. LAIV can be thawed in a refrigerator and stored at 35.6° F–46.4° F (2° C–8° C) for ≤60 hours before use. It should not be refrozen after thawing.~~ Additional information regarding LAIV storage is available at http://www.FluMist.com.

Vaccination of Specific HCP Populations

Pregnant Women

Pregnant women are at increased risk for influenza-related complications (*96–103*) and hospitalizations (*104*). Therefore, all HCP who are pregnant during the influenza season should be vaccinated against influenza. However, pregnant women should receive only inactivated influenza vaccine; LAIV is not recommended for use during pregnancy. Inactivated influenza vaccine may be administered in any trimester. One study of influenza vaccination of approximately 2,000 pregnant women demonstrated no adverse fetal effects associated with receipt of inactivated influenza vaccine (*105*).

Breastfeeding Mothers

Influenza vaccine does not affect the safety of mothers who are breastfeeding or their infants. Breastfeeding does not adversely affect the immune response and is not a contraindication for vaccination.

Persons Infected with HIV

Detailed information on the use of influenza vaccine among persons infected with HIV has been published previously (*18*). Because influenza can result in serious illness and influenza vaccination can result in the production of protective antibody titers, vaccination with inactivated vaccine will benefit HIV-infected persons, including those that are pregnant.

Timing of Annual Influenza Vaccination of HCP

Timing of Organized Vaccination Campaigns

Planning for influenza campaigns should begin as early as February or March (*106*). The optimal time to vaccinate HCP is during October–November. Beginning in October each year, health-care facilities should offer influenza vaccinations to all full- and part-time staff. Particular emphasis should be placed on vaccinating HCP who care for persons at high risk. Vaccination programs should educate HCP regarding the benefits of vaccination and the potential health consequences of influenza illness for themselves and their patients. As part of employee health programs, all HCP should be provided convenient access to free influenza vaccine at the work site (*107*).

Vaccination in December and Later

To improve vaccine coverage among HCP, influenza vaccine should continue to be offered in December and throughout the influenza season as long as vaccine supplies are available, even after influenza activity has been documented in the community. In the United States, seasonal influenza activity can increase as early as October or November, but influenza activity has not reached peak levels in the majority of recent seasons until late December–early March. Therefore, although the timing of influenza activity can vary by region, vaccine administered after November is likely to be beneficial in the majority of influenza seasons. Adults achieve peak antibody protection against influenza infection 2 weeks after vaccination (*108,109*).

UPDATE: FLUMIST SHOULD BE STORED IN A REFRIGERATOR BETWEEN 2 – 8°C (35 – 46°F) UPON RECEIPT AND UNTIL USE BEFORE THE EXPIRATION DATE. DO NOT FREEZE.

Recommendations for Prioritization of Influenza Vaccination During the 2005–06 Influenza Season

As a result of influenza vaccine distribution delays or supply shortages in the United States during recent influenza seasons (*110,111*), in September 2005, CDC issued recommendations for prioritizing the use of inactivated vaccine during the 2005–06 influenza season to ensure that early vaccine is available for those at the highest risk for complications from influenza (*112*). On the basis of uncertainties in doses and distribution, CDC recommended that the following groups receive priority for inactivated influenza vaccine until October 24, 2005:

- persons aged ≥65 years with and without comorbid conditions,
- residents of long-term–care facilities,
- persons aged 2–64 years with comorbid conditions,
- children aged 6–23 months,
- pregnant women,
- HCP who provide direct patient care, and
- household contacts and out-of-home caregivers of children aged <6 months (*112*).

These groups correspond to tiers 1A–1C in the table of inactivated influenza vaccine priority groups in the event of vaccination supply disruption that was published previously (*113*). After October 24, 2005, all persons were eligible for vaccination.

Tiered use of prioritization was not recommended for LAIV administration. LAIV may be administered at any time for vaccination of nonpregnant healthy persons aged 5–49 years, including the majority of HCP, other persons in close contact with persons at high risk for influenza-related complications, and others desiring protection against influenza (*18*).

Side Effects and Adverse Reactions Associated with Vaccination

Inactivated Influenza Vaccine

When educating HCP regarding potential side effects, providers should emphasize that 1) inactivated influenza vaccine contains noninfectious killed viruses and cannot cause influenza; and 2) coincidental respiratory disease unrelated to influenza vaccination can occur after vaccination. The occurrence of vaccine-related side effects has had limited to no impact on rates of absenteeism among HCP (*16,17*).

Local Reactions

The most frequent side effect of vaccination (affecting 10%–64% of patients) is soreness at the vaccination site, typically lasting <2 days (*21,114–116*). Local reactions typically are mild and rarely interfere with a person's ability to conduct everyday activities. In a controlled trial, only body aches (25.1%) were reported more frequently after inactivated influenza vaccine than placebo-injection (20.8%) (*117*).

Systemic Reactions

Fever, malaise, myalgia, and other systemic symptoms can occur after vaccination with inactivated vaccine and most often affect persons (e.g., infants) with no previous exposure to the influenza virus antigens in the vaccine (*118,119*). Such reactions typically begin 6–12 hours after vaccination and can persist for 1–2 days. Recent placebo-controlled trials demonstrate that among older persons and healthy young adults, administration of split-virus (i.e., detergent-disrupted virion) influenza vaccine is not associated with higher rates of systemic symptoms (e.g., fever, malaise, myalgia, and headache) compared with placebo injections (*21,114–116*). No increase in asthma exacerbations has been documented in association with receipt of influenza vaccine (*117*).

Severe Adverse Events

Immediate and presumably allergic reactions (e.g., hives, angioedema, allergic asthma, and systemic anaphylaxis) rarely occur after influenza vaccination (*120*). These reactions probably result from hypersensitivity to certain vaccine components; the majority of reactions probably are caused by residual egg protein. Although current influenza vaccines contain only a limited quantity of egg protein, this protein can induce immediate hypersensitivity reactions among persons who have severe egg allergy. Persons who have had hives or swelling of the lips or tongue, or who have experienced acute respiratory distress or collapse after eating eggs should consult a physician for appropriate evaluation to help determine if vaccine should be administered. Persons who have documented immunoglobulin E (IgE)-mediated hypersensitivity to eggs, including those who have had occupational asthma or other allergic responses to egg protein, might also be at increased risk for allergic reactions to influenza vaccine, and consultation with a physician should be considered. Protocols have been published for administering influenza vaccine safely to persons with egg allergies (*121–123*).

Hypersensitivity reactions to any vaccine component can occur. Although exposure to vaccines containing thimerosal can

lead to induction of hypersensitivity, the majority of patients do not have reactions to thimerosal when it is administered as a component of vaccines, even when patch or intradermal tests for thimerosal allergy indicate hypersensitivity (*124,125*). When reported, hypersensitivity to thimerosal typically has consisted of local, delayed hypersensitivity reactions (*124*).

GBS

Investigations to date indicate no substantial increase in GBS associated with influenza vaccines (other than the 1976 swine influenza vaccine) (*126–130*). If current influenza vaccines pose a risk for GBS, the estimated risk is approximately one additional case per million persons vaccinated, with the total combined number of GBS cases peaking 2 weeks after vaccination (*131*). This estimated risk for GBS is substantially less than the risk for severe influenza, which can be prevented by vaccination among all age groups, especially persons aged ≥65 years and those who have medical indications for influenza vaccination. The potential benefits of influenza vaccination in preventing serious illness, hospitalization, and death substantially outweigh the possible risks for experiencing vaccine-associated GBS. The average case-fatality ratio for GBS is 6% and increases with age (*132,133*). No evidence indicates that the case-fatality ratio for GBS differs among vaccinated persons and those not vaccinated.

Incidence of GBS among the general population is low, but persons with a history of GBS have a substantially greater likelihood of subsequently experiencing GBS than persons without such a history (*128,134*). Whether influenza vaccination might increase the risk for recurrence of GBS is unknown; for this reason, persons who are not at high risk for severe influenza complications and who are known to have experienced GBS within 6 weeks after a previous influenza vaccination should not receive vaccine. Chemoprophylaxis using influenza antivirals might be an alternative for such persons. Although data are limited, for the majority of persons who have a history of GBS and who are at high risk for severe complications from influenza, the established benefits of influenza vaccination justify yearly vaccination. Health-care professionals should promptly report all clinically significant adverse events after influenza vaccination to the Vaccine Adverse Event Reporting System (VAERS), even if evidence is lacking that the vaccine caused the event.

LAIV

Until additional data are available, persons at high risk for experiencing complications from influenza infection (e.g., immunocompromised patients; patients with asthma, cystic fibrosis, or chronic obstructive pulmonary disease; or persons aged ≥65 years) should not be vaccinated with LAIV. Protection from influenza among these groups should be accomplished by using inactivated influenza vaccine.

Among adults, runny nose or nasal congestion (28%–78%), headache (16%–44%), and sore throat (15%–27%) have been reported more often among vaccine recipients than placebo recipients (*37,135,136*). In one clinical trial among a subset of healthy adults aged 18–49 years, signs and symptoms reported more frequently among LAIV recipients (n = 2,548) than placebo recipients (n = 1,290) within 7 days after each dose included cough (13.9% and 10.8%, respectively); runny nose (44.5% and 27.1%, respectively); sore throat (27.8% and 17.1%, respectively); chills (8.6% and 6.0%, respectively); and tiredness or weakness (25.7% and 21.6%, respectively) (*37*). Pneumonia, bronchitis, bronchiolitis, or central nervous system events have not been observed more frequently among LAIV than among placebo recipients.

Severe Adverse Events

Serious adverse events associated with receipt of LAIV among healthy adults aged 18–49 years occur at a rate of <1% (*137*). However, surveillance should continue for adverse events that might not have been detected in previous studies. Health-care professionals should promptly report to VAERS all clinically significant adverse events after LAIV administration, even if evidence is lacking that the vaccine caused the event.

Additional Information Regarding Influenza Infection Control in Health-Care Settings

Additional information on controlling and preventing influenza in health-care settings is available in the following publications:

- CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2005;54(No. RR-8):1–40.
- Garner JS, Hospital Infection Control Practices Advisory Committee. Guideline for isolation precautions in hospitals. Infect Control Hosp Epidemiol 1996;17:53–80.
- CDC. Guidelines for preventing health-care–associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR 2003;53(No. RR-3):1–36.
- CDC. Respiratory hygiene/cough etiquette in health-care settings. Atlanta, GA: US Department of Health and

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TEMPLATE POLICY STATEMENT

[YOUR INSTITUTION'S NAME] Policy for Influenza Immunization of Health Care Workers

Influenza is a serious infection that causes an average of 36,000 deaths and 114,000 hospitalizations in the United States each year.[1] Health care workers* are at high risk for acquiring influenza infection because of their exposure to ill patients, as well as their exposure in the community. Health care workers infected with influenza can spread the virus to patients in their care.[2-4] In fact, research suggests that health care workers can be a key source of institutional outbreaks, contributing to increased morbidity and mortality among vulnerable patients.[1] Health care workers encounter patients throughout the influenza season in a variety of settings, including medical practices, general hospitals, specialty hospitals, pediatric hospitals,[5,6] long-term care facilities,[7] emergency departments,[8] ambulatory care settings, rehabilitation facilities and home-care sites.

Vaccination is the primary means of reducing transmission and preventing influenza infection, yet immunization rates among health care workers remain low. Only 36 percent of workers who have direct contact with patients are immunized annually, despite long-standing recommendations issued by the Centers for Disease Control and Prevention (CDC) and the Association for Professionals in Infection Control and Epidemiology (APIC) and other national health care organizations.[1,9,10]

Greater emphasis needs to be placed on improving influenza immunization rates among health care workers to help ensure patient safety and protection—especially for patients at increased risk of influenza-related complications.[7] Immunization also provides personal protection for health care workers and minimizes workforce absenteeism during the influenza season.[11]

TRANSMISSION

Influenza is transmitted by direct and indirect contact and by droplet contact. There may be an airborne component to transmission as well. Therefore, the virus is easily spread from person to person via coughing, sneezing, and contact with contaminated items and surfaces. The virus can spread rapidly, especially in classrooms, households, offices, and medical settings.

Individuals are generally infectious 1-4 days before the onset of symptoms; however, only around 50% of infected persons will develop classical symptoms of influenza, making exclusion of infected health care workers difficult.[1,12] Moreover, individuals remain infectious five or more days after symptoms appear. Studies show health care personnel are more likely than staff in other areas to work through or return to work sooner during illness, thus increasing the likelihood of transmitting the virus to patients.[13]

INSTITUTIONAL INFLUENZA OUTBREAKS

Institutional influenza outbreaks can have serious implications for both the patient and health care provider. These events can put patients at risk, result in or exacerbate existing staff shortages, curtail admissions, and increase health care costs. An outbreak in a tertiary neonatal intensive care unit (NICU) in the year 2000 included 19 infants, one of whom died. Only 15 percent of staff in the facility had been immunized against influenza. Although investigators could not pinpoint the source of the outbreak, a health care worker was the suspected source; since influenza-like-illness was not found in the mothers of these infants.[14]

A 2001 report documented an outbreak that included four influenza cases among patients in a 12-bed, single-room transplant unit. Three of the four affected patients had no visitors between admission and influenza infection to account for the spread. Investigators concluded that health care workers were the likely source of transmission.[15]

A very large outbreak in the early 1990s occurred in a nursing home in New York. Nineteen percent of residents developed influenza. A total of 34 individuals developed pneumonia; 19 were hospitalized, and two died. In this facility, only 10 percent of health care workers were immunized.[16]

While index cases are not always identifiable, health care workers can easily propagate an outbreak as they move from patient to patient. It is also clear that unvaccinated health care workers can be the index case for influenza in a facility, potentially posing a threat to high-risk patients and other workers.

ECONOMIC IMPACT OF OUTBREAKS

Influenza outbreaks are associated with substantial direct and indirect costs. An outbreak in an internal medicine ward of a French hospital in 1999, in which 41 percent of patients and 23 percent of staff were infected, resulted in 14 days of staff sick leave and suspension of all admissions to the ward, including eight that were previously scheduled. The total cost of the outbreak in this small ward was estimated at $34,000 (U.S. dollars).[17] Amantadine resistance was documented in a small pediatric NICU outbreak. Oseltamivir, an expensive alternative therapy, was used to halt the outbreak instead. In a bone marrow transplant unit, Oseltamivir was also used in place of prophylactic amantadine during an outbreak because concomitant use of immuno-suppressant therapy and amantadine has been shown to increase the incidence of patient falls, which could have had dire consequences in these patients.[18]

Ensuring the health and safety of health care workers has additional implications for patient safety and health care cost containment. Hiring replacement workers often means assuming additional costs beyond those associated with salary. Studies show that using pool staff in place of experienced unit staff increases the incidence of medical errors. On occasions when staff members work a double shift, it has been shown that attention decreases after 12 hours of work.[19]

ROLE OF HEALTH CARE FACILITIES

Health care facilities have an important role to play in maximizing influenza vaccination rates among health care workers. Every facility should develop and implement comprehensive influenza vaccination programs for employees.[8,9]

RECOMMENDATIONS

[NAME OF INSTITUTION] recommends the following measures be implemented to increase influenza immunization rates among its health care workers and improve patient safety and personal health.

- Health care workers should receive an annual influenza immunization to prevent spread of the virus to vulnerable patients.
- Develop an influenza immunization program that is implemented annually, to
    - Educate health care workers about the importance of influenza immunization in health care settings and the low risk of adverse events associated with immunization;[20]
    - Increase vaccine demand among health care workers;
    - Reduce barriers to immunization of health care workers by developing programs that increase access to immunization and reduce the cost of the vaccine;[21] and
    - Facilitate the influenza vaccination process, for example, through the use of standing orders issued by the Occupational Health Program for influenza vaccination of health care workers.
- Monitor annual immunization rates of employees and provide feedback through the infection control and patient safety programs.
- Monitor and track influenza rates among health care workers and compare those figures to this group's immunization rates. Providing this information may stimulate health care workers to seek vaccination.
- Work with public health officials to track community incidence of influenza, using data from emergency rooms, physicians' offices, and clinics. As the incidence increases, infection control and hospital administration should work together to identify pending admissions of potential influenza cases and to establish parameters for visitor restrictions.

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Article - Health - General

§ 18-404.

(a) (1) In this section the following words have the meanings indicated.

(2) "Employee" means an individual employed full-time or part-time directly, through contract with another entity, or as an independent contractor, by a related institution.

(3) "Related institution"[1] has the meaning provided under § 19-301(o) of this article.

(4) "Medically contraindicated" means that a medical treatment is potentially detrimental to the health of the individual intended to be treated.

(b) (1) Subject to subsection (e) of this section, each related institution in the State shall immunize residents against the influenza virus and pneumococcal disease.

(2) Subject to subsection (e) of this section, each related institution in the State shall immunize employees against the influenza virus.

(3) Before an immunization under this section is administered, the related institution shall obtain written consent to administer the immunization from:

(i) The resident or employee receiving the immunization; or

(ii) The legal guardian of the resident receiving the immunization.

(c) Each related institution shall conduct the immunizations required under subsection (b) of this section:

(1) In accordance with the recommendations established by the Advisory Committee on Immunization Process of the United States Centers for Disease Control and Prevention that are in effect at the time the related institution conducts the immunizations; and

(2) By December 1 of each year that the immunization is required.

(d) A related institution that accepts an individual as a new resident or accepts an individual as a new employee after December 1 but before April 1 shall:

(1) Determine the individual's status for immunization as required under subsection (b) of this section; and

(2) If necessary, provide or arrange for an immunization as required under subsection (b) of this section.

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(e) A resident or employee is not required to receive a vaccine under this section if:

(1) The vaccine is medically contraindicated for the resident or employee;

(2) The vaccine is against the resident or employee's religious beliefs; or

(3) After being fully informed by the related institution of the health risks associated with not receiving a vaccine, the resident or employee refuses the vaccine.

(f) (1) (i) Each related institution shall document the annual immunization against influenza virus and immunization against pneumococcal disease received by each resident in the resident's medical record.

(ii) Each related institution shall document the annual immunization against influenza virus received by each employee in the employee's personnel file.

(2) If a resident or employee refuses to be immunized as required under subsection (b) of this section, the related institution shall document the refusal and the reason for the refusal.

(g) Each related institution shall:

(1) Notify each prospective resident and each prospective employee of the immunization requirements of this section and request that the resident or employee agree to be immunized in accordance with subsection (b)(3) of this section; and

(2) Make available to all residents and employees of the related institution educational and informational materials relating to immunization against influenza virus and immunization against pneumococcal disease.

Citation: Annotated Code of Maryland 18-404.

Standing Orders for Administering Influenza Vaccine to Adults

Purpose: To reduce morbidity and mortality from influenza by vaccinating all adults who meet the criteria established by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices.

Policy: Under these standing orders, eligible nurses and other healthcare professionals (e.g., pharmacists), where allowed by state law, may vaccinate patients who meet any of the criteria below.

Procedure:

1. Identify adults in need of influenza vaccination based on meeting any of the following criteria:
   a. Want to reduce the likelihood of becoming ill with influenza or of transmitting it to others
   b. Age 50 years or older
   c. Having any of the following conditions:
      - chronic disorder of the pulmonary or cardiovascular system, including asthma
      - chronic metabolic disease (e.g., diabetes), renal dysfunction, hemoglobinopathy, or immunosuppression (e.g., caused by medications, 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, seizure disorder or other neuromuscular disorder)
   d. Being pregnant during the influenza season
   e. Residence in a nursing home or other chronic-care facility that houses persons of any age who have chronic medical conditions
   f. In an occupation or living situation that puts one in proximity to persons at high risk, including
      - a healthcare worker, caregiver, or household member in contact with person(s) at high risk of developing complications from influenza
      - a household contact or out-of-home caretaker of a child age 0–59 months or of an adult age 50 years or older
2. Screen all patients for contraindications and precautions to influenza vaccine:
   a. **Contraindications:** serious reaction (e.g., anaphylaxis) after ingesting eggs or after receiving a previous dose of influenza vaccine or an influenza vaccine component. For a list of vaccine components, go to www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/excipient-table-2.pdf. Do not give live attenuated influenza vaccine (LAIV) to an adult who is pregnant or who has any of the conditions described in 1.b. or 1.c. above. Use of inactivated influenza vaccine is preferred over LAIV for close contacts of severely immunosuppressed persons during periods when the immunocompromised person requires a protective environment.
   b. **Precautions:** moderate or severe acute illness with or without fever; history of Guillain Barré syndrome within 6 weeks of a previous influenza vaccination.
3. Provide all patients with a copy of the most current federal Vaccine Information Statement (VIS). You must document in the patient's medical record or office log, the publication date of the VIS and the date it was given to the patient. Provide non-English speaking patients with a copy of the VIS in their native language, if available; these can be found at www.immunize.org/vis.
4. Administer 0.5 mL of injectable trivalent inactivated influenza vaccine (TIV) IM (22–25g, 1–1½" needle) in the deltoid muscle. Alternatively, healthy adults younger than age 50 years without contraindications may be given 0.2 mL of intranasal LAIV; 0.1 mL is sprayed into each nostril while the patient is in an upright position.
5. Document each patient's vaccine administration information and follow up in the following places:
   a. **Medical chart:** Record the date the vaccine was administered, the manufacturer and lot number, the vaccination site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reason(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
   b. **Personal immunization record card:** Record the date of vaccination and the name/location of the administering clinic.
6. Be prepared for management of a medical emergency related to the administration of vaccine by having a written emergency medical protocol available, as well as equipment and medications.
7. Report all adverse reactions to influenza vaccine to the federal Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or (800) 822-7967. VAERS report forms are available at www.vaers.hhs.gov.

This policy and procedure shall remain in effect for all patients of the _____ until rescinded or until _____ (date).
(name of practice or clinic)

Medical Director's signature: _____ Effective date: _____

Technical content reviewed by the Centers for Disease Control and Prevention, August 2008.

www.immunize.org/catg.d/p3074.pdf • Item #P3074 (8/08)

Standing Orders for Administering Influenza Vaccines to Children & Adolescents

Purpose: To reduce morbidity and mortality from influenza by vaccinating all children and adolescents who meet the criteria established by the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices.

Policy: Under these standing orders, eligible nurses and other healthcare professionals (e.g., pharmacists), where allowed by state law, may vaccinate children and adolescents who meet any of the criteria below.

Procedure:

1. Identify children and adolescents in need of influenza vaccination based on meeting any of the following criteria:
   a. Age 6 months through 18 years
   b. Age 19 years and older with any of the following conditions:
      • chronic disorder of the pulmonary or cardiovascular system, including asthma
      • chronic metabolic disease (e.g., diabetes), renal dysfunction, hemoglobinopathy, or immunosuppression (e.g., caused by medications, 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, seizure disorder or other neuromuscular disorder)
      • long-term aspirin therapy (applies to a child or adolescent ages 6 months–18 years)
   c. Being pregnant during the influenza season
   d. Residence in a nursing home or other chronic-care facility that houses persons of any age who have chronic medical conditions
   e. In an occupation or living situation that puts one in proximity to persons at high risk, including
      • a healthcare worker, caregiver, or household member in contact with person(s) at high risk of developing complications from influenza
      • a household contact or out-of-home caretaker of a child age 0–59 months or of an adult age 50 years or older
2. Screen all patients for contraindications and precautions to influenza vaccine:
   a. **Contraindications:** serious reaction (e.g., anaphylaxis) after ingesting eggs or after receiving a previous dose of influenza vaccine or an influenza vaccine component. For a list of vaccine components, go to www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/B/excipient-table-2.pdf. Do not give live attenuated influenza vaccine (LAIV) to pregnant adolescents, children younger than age 2 years, children younger than age 5 years with possible reactive airways disease (e.g., history of recurrent wheezing or a recent wheezing episode), or to children or adolescents with any of the conditions described in 1.b. above. Use of inactivated influenza vaccine is preferred over LAIV for close contacts of severely immunosuppressed persons during periods when the immunocompromised person requires a protective environment.
   b. **Precautions:** moderate or severe acute illness with or without fever; history of Guillain-Barré syndrome within 6 weeks of a previous influenza vaccination
3. Provide all patients (or, in the case of a minor, their parent or legal representative) with a copy of the most current federal Vaccine Information Statement (VIS). You must document in the patient's medical record or office log, the publication date of the VIS and the date it was given to the patient (parent/legal representative). Provide non-English speaking patients with a copy of the VIS in their native language, if available; these can be found at www.immunize.org/vis.
4. Administer injectable trivalent inactivated vaccine (TIV) intramuscularly in the vastus lateralis for infants (and toddlers lacking adequate deltoid mass) or in the deltoid muscle (for toddlers, children, and teens). Use a 22–25 g needle. Choose needle length appropriate to the child's age and body mass: infants 6–11 mos: 1"; 12 mos–10 yrs: 1–1¼"; 11 yrs and older: 1–1½". Give 0.25 mL for children 6–35 months and 0.5 mL for all others age 3 years and older. Alternatively, healthy children age 2 years and older without contraindications may be given 0.2 mL of intranasal LAIV; 0.1 mL is sprayed into each nostril while the patient is in an upright position. Children age 6 months through 8 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by at least 4 weeks).
5. Document each patient's vaccine administration information and follow up in the following places:
   a. **Medical chart:** Record the date the vaccine was administered, the manufacturer and lot number, the vaccination site and route, and the name and title of the person administering the vaccine. If vaccine was not given, record the reason(s) for non-receipt of the vaccine (e.g., medical contraindication, patient refusal).
   b. **Personal immunization record card:** Record the date of vaccination and the name/location of the administering clinic.
6. Be prepared for management of a medical emergency related to the administration of vaccine by having a written emergency medical protocol available, as well as equipment and medications.
7. Report all adverse reactions to influenza vaccine to the federal Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or (800) 822-7967. VAERS report forms are available at www.vaers.hhs.gov.

This policy and procedure shall remain in effect for all patients of the _____ (name of practice or clinic) until rescinded or until _____ (date).

Medical Director's signature: _____ Effective date: _____

Technical content reviewed by the Centers for Disease Control and Prevention, August 2008.

APPROVED: New Infection Control Requirement for Offering Influenza Vaccination to Staff and Licensed Independent Practitioners

The Joint Commission has approved a new Infection Control standard that requires organizations to offer influenza vaccination to staff and licensed independent practitioners, applicable to **critical access hospitals, hospitals,** and **long term care, effective July 1, 2007**. This standard conforms to recommendations recently made by the Centers for Disease Control and Prevention. This new requirement is shown in the box on page 11 in underlined text.

These revisions will also be published in the *2007 Comprehensive Accreditation Manual for Critical Access Hospitals (CAMCAH),* Update 2 to the *2006 Comprehensive Accreditation Manual for Hospitals: The Official Handbook (CAMH),* and Update 2 to the *2005–2006 Comprehensive Accreditation Manual for Long Term Care (CAMLTC),* available September 2006. ▲

(Continued on page 11)

New IC Requirement for Offering Flu Vaccinations *(continued)*

(Continued from page 10)

OFFICIAL PUBLICATION OF NEW STANDARD

New Standard IC.4.15

APPLICABLE TO CRITICAL ACCESS HOSPITAL, HOSPITAL, AND LONG TERM CARE

Standard IC.4.15

Immunization against influenza is offered to staff[1] and licensed independent practitioners.

Rationale for IC.4.15

Transmission of influenza from staff and licensed independent practitioners to [patients/residents] can create serious health care problems, especially among those who are at high risk for complications related to influenza. There are multiple effective measures that can reduce the risk of health care–associated influenza, including strict adherence to respiratory precautions; prompt treatment; and restricting ill staff and licensed independent practitioners from providing [patient/resident] care. However, the most successful measure to prevent health care–associated transmission of influenza is vaccinating staff and licensed independent practitioners.

Since 1981, the Centers for Disease Control and Prevention (CDC) has recommended annual influenza vaccinations for all health care personnel.[2] The recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP) concerning influenza vaccination of health care personnel (HCP) in the United States apply to HCP in acute care hospitals, nursing homes, skilled nursing facilities, physician's offices, urgent care centers, and outpatient clinics, and to persons who provide home health care and emergency medical services.[3] Despite ongoing recommendations, vaccination rates as measured by the CDC remain low. Influenza among health care personnel, especially during an epidemic, might increase transmission to [patients/residents], and may compromise the ability of an organization to provide care.

One obstacle to effective vaccination is declination by health care personnel. Health care personnel may decline vaccination for many reasons. They may have been vaccinated elsewhere, have a medical contraindication, or have other personal reasons for declining the vaccine. Vaccination might also be declined because it is offered at inconvenient times or locations. Whatever the reason, it is important for organizations to identify why individuals do not participate in the vaccination program, work to overcome these reasons, and increase vaccination rates.

Optimally, influenza vaccination will be offered to everyone. During periods of influenza vaccine supply disruption, organizations may have to establish priorities for who they will vaccinate. The CDC recommends the use of vaccination priority groups only in the event of vaccine supply disruptions.

Elements of Performance for IC.4.15

A 1. The organization establishes an annual influenza vaccination program that includes at least staff and licensed independent practitioners.

A 2. The organization provides access to influenza vaccination on-site.

B 3. The organization educates staff and licensed independent practitioners about the following:

- Flu vaccination
- Non-vaccine control measures (such as the use of appropriate precautions)
- The diagnosis, transmission, and potential impact of influenza

B 4. The organization annually evaluates vaccination rates and reasons for non-participation in the organization's immunization program.

B 5. The organization implements enhancements to the program to increase participation.

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[1] *The requirements in standard IC.4.15 do not apply to students.*

[2] *The CDC defines health care personnel (HCP) as all paid and unpaid persons working in health care settings who have the potential for exposure to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. HCP might include (but are not limited to) physicians, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual staff not employed by the health-care facility, and persons (for example, clerical, dietary, housekeeping, maintenance, and volunteers) not directly involved in [patient/resident] care but potentially exposed to infectious agents that can be transmitted to and from HCP.*

[3] *The following is a summary of the recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP) concerning influenza vaccination of health-care personnel (HCP) in the United States. These recommendations apply to HCP in acute care hospitals, nursing homes, skilled nursing facilities, physician's offices, urgent care centers, and outpatient clinics, and to persons who provide home health care and emergency medical services.*

- *Educate HCP regarding the benefits of influenza vaccination and the potential health consequences of influenza illness for themselves and their [patients/residents], the epidemiology and modes of transmission, diagnosis, treatment, and nonvaccine infection control strategies, in accordance with their level of responsibility in preventing health-care–associated influenza (category IB).*
- *Offer influenza vaccine annually to all eligible HCP to protect staff, [patients/residents], and family members and to decrease HCP absenteeism. Use of either available vaccine (inactivated and live, attenuated influenza vaccine [LAIV]) is recommended for eligible persons. During periods when inactivated vaccine is in short supply, use of LAIV is especially encouraged when feasible for eligible HCP (category IA).*
- *Provide influenza vaccination to HCP at the work site and at no cost as one component of employee health programs. Use strategies that have been demonstrated to increase influenza vaccine acceptance, including vaccination clinics, mobile carts, vaccination access during all work shifts, and modeling and support by institutional leaders (category IB).*
- *Obtain a signed declination from HCP who decline influenza vaccination for reasons other than medical contraindications (category II).*
- *Monitor HCP influenza vaccination coverage and declination at regular intervals during influenza season and provide feedback of ward-, unit-, and specialty-specific rates to staff and administration (category IB).*
- *Use the level of HCP influenza vaccination coverage as one measure of a [patient/resident] safety quality program (category II).*

Evidence Ranking Scheme

Category IA. *Strongly recommend for implementation and strongly supported by well-designed experimental, clinical, or epidemiological studies.*
Category IB. *Strongly recommended for implementation and supported by certain experimental, clinical, or epidemiological studies and a strong theoretic rationale.*
Category IC. *Required by state or federal regulation, or representing an established association standard.*
Category II. *Suggested for implementation and supported by suggestive clinical or epidemiologic studies, or a theoretic rationale.*
Unresolved Issue. *No recommendation is offered. No consensus or insufficient evidence exists regarding efficacy.*

Immunization Reduces Disease Risk Inherent with Patient Contact

Through their clinical skills and experience, health-care workers (HCWs) provide immeasurable benefits to patients in all health-care settings. While direct patient contact is an occupational necessity, it also carries the risk of transmitting or contracting diseases, such as influenza, and pertussis.

The good news is that immunization against vaccine-preventable diseases is available, enabling HCWs to protect themselves from acquiring or transmitting infections. Vaccines help HCWs to protect themselves, their families, and their patients. Studies have shown that hospital outbreaks of diseases such as influenza have resulted from transmission from patient to HCW and vice versa.[1] The path of transmission is usually undetected before an outbreak.

The reality is that direct patient contact is conducive to spreading disease. For all HCWs with the vital role of patient contact, immunization offers the best defense against disease transmission.

HCW immunization remains low

Studies have shown that, in general, HCWs do not take advantage of the protection that immunizations provide. Despite organizational efforts to encourage influenza vaccinations, national influenza immunization rates among HCWs **remain below 40%.**[2] The Centers for Disease Control and Prevention (CDC) recommends annual influenza vaccine for all HCWs, yet a high percentage of them remain unprotected each year.[2] Influenza immunization can help protect HCWs and reduce the national burden of morbidity and mortality associated with the disease.[2]

Consider another disease, **pertussis, commonly called *whooping cough*, which reached a 45-year high in 2004, with 25,827 reported cases.**[3] Adults, whose childhood immunity to pertussis may have worn off, are often unknowingly a major source of pertussis infection for infants, who suffer the most severe and deadly consequences from this vaccine-preventable disease.[3]

Now, with the availability of tetanus/diphtheria/acellular pertussis (**Tdap**) booster vaccines, the Advisory Committee on Immunization Practices (ACIP) recently voted to recommend that all HCWs receive a **Tdap** booster **vaccine as soon as feasible.**[4] The ACIP recommendation is intended to increase protection against pertussis and to prevent pertussis transmission to infants. Specifically, the ACIP is **focusing on health-care personnel who work in hospitals or ambulatory care settings and have direct patient contact. Priority should be given to health-care personnel who have direct contact with infants younger than 12 months of age.**[4]

While immunization helps to protect HCWs, does it actually benefit patients as well? Results from the following study indicate that increasing HCW influenza immunization rates can reduce nosocomial influenza cases among hospitalized patients.[5]

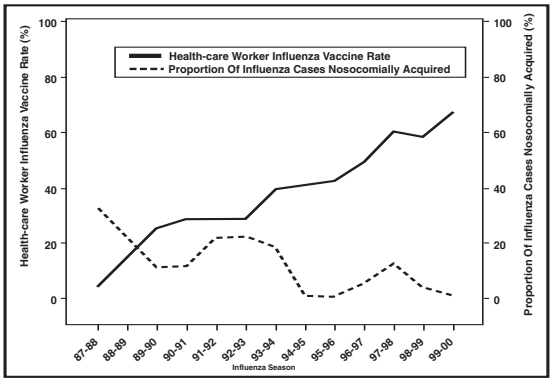
The benefits of influenza vaccination are borne out in a review of 12 influenza seasons in a tertiary-care facility[5]

The relationship between staff vaccination coverage and annual incidence of nosocomial influenza was assessed for 12 influenza seasons in one institution from 1987-2000. During this period, **staff vaccination increased from 4%** in 1987-1988 **to 67%** in 1999-2000, and **HCWs accounted for 42% of all confirmed influenza cases** during 1990-1993, and accounted for 9% during 1997-2000.[5]

There was also a progressive and significant reduction in the relative frequency of nosocomial influenza cases among hospitalized patients during this period (P<.0001). From 1987-1988, **32%** of influenza cases among hospitalized patients were due to nosocomial acquisition; this decreased to just **3%** during the 1998-1999 season, and there were no reported nosocomial cases during the 1999-2000 season. Analysis indicated that there was a statistically significant inverse association between staff compliance with vaccination and the rate of nosocomial influenza among patients.[5]

As shown in the following graph, the significant increase in HCW immunization coverage corresponds to a significant reduction in laboratory-confirmed nosocomial influenza cases among hospitalized patients.[5]

Significant increase in rate of HCW vaccination corresponds with significant reduction in the proportion of all nosocomial influenza cases among hospitalized patients[5]



HCWs need to lead the way in reducing transmission of vaccine-preventable diseases

By getting recommended immunizations, HCWs can help protect themselves, patients, and other staff members. The benefits that HCWs accrue from influenza and Tdap vaccinations are far-reaching:

- Reduce the incidence of hospital-acquired (nosocomial) outbreaks[6]
- Decrease transmission of influenza, pertussis, or other vaccine-preventable diseases to their patients, their families, or community[6]
- Reduce the number of HCW sick days and absenteeism from respiratory infections by as much as 28%[1]
- Promote herd immunity among HCWs by increasing the percentage of workers who are immunized, which reduces the risk of disease transmission[1]—thus protecting the health of all HCWs, even those noncompliant with immunizations
- Reduce disruptions and costs incurred by HCWs and hospitals resulting from pertussis outbreaks[7]
- Cut down on double shifts, staff shortages, and use of replacement workers, factors shown to lower workplace quality and increase adverse events in patients[6]

HCWs play a key role in reducing outbreaks of vaccine-preventable diseases in health-care facilities. Immunization is their best defense in fulfilling that role. ACIP recommends that health-care facilities do their part to encourage immunization by providing HCWs with free vaccinations such as Tdap, convenient access, and education about the benefits of vaccination.[4]

HCW immunization improves the quality of patient care by reducing the spread of disease to patients, such as the elderly and infants, who are especially at risk for complications from many vaccine-preventable diseases. HCWs with patient contact provide essential medical services—and immunization helps reduce the risk of transmitting disease while providing those services to patients.

ACIP recommendations for HCW Tdap vaccination:[4]

On February 22, 2006, ACIP voted to recommend Tdap booster vaccine for HCWs as soon as feasible. **HCWs in direct contact with infants less than 12 months of age should receive a Tdap booster vaccination. Use of an interval between this Tdap vaccination and the last Td vaccination as short as 2 years is recommended and even encouraged.**

CDC recommendations for HCW influenza vaccination:[2]

All HCWs should receive annual influenza immunization.

Timing: Begin in October and continue throughout the influenza season.

References: 1. Centers for Disease Control and Prevention (CDC). Influenza vaccination of health-care personnel: recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 2006;55(RR-2):1-16. **2.** CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 2006;55(RR-10):1-43. **3.** CDC. Pertussis. In: Atkinson W, Hamborsky J, McIntyre L, Wolfe C, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book.* 9th ed. Washington, DC: Public Health Foundation; 2006:79-96. **4.** CDC. National Immunization Program. ACIP votes to recommend use of combined tetanus, diphtheria and pertussis (Tdap) vaccine for adults (Advisory Committee on Immunization Practices): March 2, 2006. Available at: http://www.cdc.gov/nip/vaccine/tdap/tdap_adult_recs.pdf. Accessed July 10, 2006. **5.** Salgado CD, Giannetta ET, Hayden FG, Farr BM. Preventing nosocomial influenza by improving the vaccine acceptance rate of clinicians. *Infect Control Hosp Epidemiol.* 2004;25:923-928. **6.** National Foundation for Infectious Diseases. Improving influenza vaccination rates in health care workers: strategies to increase protection for workers and patients. 2004:1-21. **7.** Calugar A, Ortega-Sánchez IR, Tiwari T, Oakes L, Jahre JA, Murphy TV. Nosocomial pertussis: costs of an outbreak and benefits of vaccinating health care workers. *Clin Infect Dis.* 2006;42:981-988.

Successful Campaigns for Vaccinating Healthcare Workers

- Prior to the start of influenza season, remind health care personnel of the importance of vaccination and when the vaccine will be available.
- Sponsor a kick-off event.
- Offer vaccine free of charge to all staff and volunteers.
- Educate employees via fact sheets, newsletters or bulletin board posting. Advise employees about the benefits of vaccination for themselves, patients, and co-workers.
- Administer vaccine under a standing orders protocol. Request that staff who decline vaccination sign a declination form that includes their reason for not getting vaccinated.
- Make vaccines available to all employees on all shifts.
- Use mobile carts to offer vaccine in all different clinic areas, service meetings, grand rounds, and or near cafeteria entrances.
- In late November, identify employees not yet vaccinated and remind them by email or telephone that the flu vaccine is available.
- Work closely with the pharmacy department to get an ample supply of vaccine for employees.
- Encourage the facility director, service chiefs, and other managers to set an example by getting vaccinated and encouraging their staff to get immunized.
- Offer employees who have been vaccinated buttons or stickers that say "Ask me if I got my flu vaccination"" or "Flu Fighter".

Adapted from VA Influenza Vaccination Toolkit. United States Department of Veterans Affairs, September 2005.

FACES OF

INFLUENZA

American Lung Association's Influenza Prevention Program

In collaboration with sanofi pasteur

MYTHS & FACTS About Influenza

We all know someone who needs to be immunized against influenza this year. In fact, it is likely that you or someone in your family fall into one of the groups that health-care officials recommend to receive an influenza immunization. Many misconceptions about the influenza virus and influenza vaccine persist, despite the widespread impact of the disease and the benefit of the vaccine.

MYTH: Influenza is no more than a nuisance, much like the common cold, that cannot be prevented.

FACT: Influenza, commonly referred to as the "flu," is a severe and sometimes life-threatening disease that causes an average of 36,000 deaths and approximately 226,000 hospitalizations in the U.S. each year. You can avoid getting influenza by getting vaccinated each year.[1]

MYTH: You can get influenza from the injectable vaccination.

FACT: The injectable vaccine does not contain any of the live virus so it is impossible to get influenza from the vaccine. Side effects may occur in some people, such as mild soreness, redness or swelling at the injection site, headache or a low-grade fever. Vaccination is the best way to prevent influenza and its complications.[1]

MYTH: It is not necessary to get immunized against influenza every year because protection lasts from previous vaccinations.

FACT: The types of influenza viruses circulating in the community change from year to year. Because of this, a new vaccine is made each year to protect against the current strains. Also, immunity to influenza viruses only lasts for a year, so it is important to get vaccinated against influenza every year.

MYTH: People shouldn't be immunized against influenza if they are sick.

FACT: Minor illnesses with or without fever should not prevent vaccination, especially in children with mild upper respiratory infections (colds) or upper respiratory allergies. In addition, people with chronic illnesses, such as asthma, diabetes and heart disease have a higher risk for contracting the influenza virus and for developing complications. These individuals should be immunized each year. Individuals with severe allergies to eggs or those who have had a previous vaccine-associated allergic reaction should avoid immunization. Talk to your health-care provider for more information.[1]

MYTH: Only the elderly are at risk for developing serious complications from the influenza virus.

FACT: Influenza impacts people of all ages. Each year, more than 226,000 Americans are hospitalized and about 36,000 die from influenza-related complications, including an average of 92 children under age 5.[1]

MYTH: I missed the chance to get an influenza vaccination in the fall, so now I have to wait until next year.

FACT: Influenza vaccination is beneficial throughout the fall and winter months. The best time to get vaccinated is in October and November, but vaccination in December or even later is still effective because the virus that causes influenza circulates into late winter. The number of influenza cases usually peaks around February, but can range from December to May.[1]

MYTH: I seem to get the stomach flu each year. My friend told me the influenza vaccine might prevent the stomach flu next year.

FACT: Unlike most other common respiratory and stomach infections that are often referred to as "the flu," influenza can cause more severe illness and can result in complications leading to hospitalization and death, especially among the elderly. Common symptoms of influenza infection include a high fever (101°F-102°F) that begins suddenly, sore throat, chills, cough, headache and muscle aches. The influenza vaccine protects you against the influenza virus but not against viral gastroenteritis, which is the correct term to use when referring to the "stomach flu."[1]

MYTH: If I receive an annual influenza vaccination, I am also protected against avian flu.

FACT: An annual influenza vaccination is designed to protect against the strains of influenza circulating that year. The seasonal influenza vaccine is not designed to protect against avian or bird flu. While there has been a recent focus on bird flu, seasonal influenza infection currently poses a far greater danger to Americans. Seasonal influenza kills and hospitalizes hundreds of thousands of people each year. Seasonal influenza infection may be prevented though vaccination.[1]

The CDC recommends the influenza vaccine every year for the following groups:[1]

- Adults and children with a chronic medical condition, such as heart disease, asthma, COPD (chronic obstructive pulmonary disease), weakened immune system and diabetes
- Children 6 – 59 months of age
- Children 6 months – 18 years of age who are on long-term aspirin treatment
- Women who are pregnant during the influenza season
- Household contacts and out-of-home caregivers of anyone in a high-risk group, including children younger than 6 months of age who are too young to be vaccinated. This includes parents, grandparents, siblings, babysitters and daycare providers.
- Adults 50 years of age and older
- Residents of long-term care facilities and nursing homes
- Health care workers who come in contact with patients
- Anyone who wants to prevent influenza

Note: Children under 9 years of age receiving an influenza vaccination for the first time need two doses approximately 1 month apart.[1]

To ensure families everywhere understand the risks of influenza, the American Lung Association has joined with Jean Smart, actress and mother, and Admiral John O. Agwunobi, Assistant Secretary of Health as well as everyday people to launch a national public educational initiative called the *Faces of Influenza*. To learn more about the program, influenza and vaccination, visit www.facesofinfluenza.org.

1. Centers for Disease Control and Prevention. Prevention and Control of Influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2006; 55(RR-10):1-42.

IMMUNIZE FIRST™
SAFEGUARDING THE HEALTH OF THE HEALTH-CARE WORKER

Influenza Immunization for Health-care Workers: Nothing to Sneeze at

Health-care workers are a primary target of the Centers for Disease Control and Prevention (CDC) for influenza (flu) immunization.[1] That's because health-care workers—including physicians, nurses, and others in both hospital and outpatient settings, such as emergency medical personnel and employees of chronic-care facilities—can transmit influenza to patients who may be at high risk of complications if they contract the disease. These include the following groups[1]:

- Persons ≥65 years of age
- Residents of nursing homes and other chronic-care facilities
- Adults and children with chronic disorders of the pulmonary or cardiovascular systems, including asthma
- Adults and children with chronic metabolic diseases (including diabetes), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or by HIV infection)
- Adults and children with conditions such as cognitive dysfunction, spinal cord injuries, or seizure disorders that can compromise respiratory function
- Children and adolescents (aged 6 months-18 years) who are receiving long-term aspirin therapy and therefore might be at risk for developing Reye syndrome if they contract influenza
- Women who will be pregnant during influenza season
- Children 6-59 months of age

For these high-risk individuals, influenza can have very serious consequences, including hospitalization and death. Each year in the United States (US), an estimated 36,000 people die from influenza and there are approximately 226,000 influenza-related hospitalizations.[1] Most mortality is a result of pneumonia and exacerbation of cardiopulmonary and other chronic conditions.

Because individuals can be infectious before symptoms appear, you may be spreading influenza to vulnerable patients without even knowing it—or patients may be infecting you! Your importance as a role model cannot be overstated. You are not only protecting yourself, but also the health of patients, as well as your family.

Influenza immunization among health-care workers is associated with reduced work absenteeism and fewer deaths among nursing home patients.[1] Yet, despite their key role in transmitting influenza, more than half of health-care workers do not receive annual immunization. In 2003, only 40.1% of health-care workers in the US were immunized.[1] According to a recent study, the most common reason cited by health-care workers for not receiving influenza immunization was concerns about side effects.[2] But, because the injectable vaccine contains only *inactivated*, or *killed*, virus, the vaccine *cannot* cause influenza.

Vaccination is the best way to control influenza and its devastating complications. When you recommend influenza immunization to patients, don't forgot about yourself and your staff. Receiving influenza immunization will help protect not only you and your family, but also the many patients with whom you come into contact every day. The CDC recommends that health-care workers receive influenza immunization in October. However, the CDC also recommends that vaccinations should continue throughout the influenza season.[1]

Sincerely,

References: 1. Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Early Release*. 2006;55:1-42. **2.** LaVela SL, Smith B, Weaver FM, Legro MW, Goldstein B, Nichol K. Attitudes and practices regarding influenza vaccination among healthcare workers providing services to individuals with spinal cord injuries and disorders. *Infect Control Hosp Epidemiol*. 2004;25:933-940.

Measles, Mumps, and Rubella: Increased Risk in the Health-care Setting

- Persons born before 1957 are often considered to be immune to measles, but age does not guarantee immunity. For example, from 1985-1992 in the US, 27% of all measles cases among HCWs occurred in persons born before 1957 (CDC, unpublished data)
- HCW risk for measles infection is estimated to be 13 times that for the general population[8]
- Mumps transmission in medical settings has still been reported nationwide (CDC, unpublished data)
- Transmission, via contact with respiratory secretions or droplets, can occur from HCWs to patients, and from patients to HCWs

ACIP recommendations for HCW MMR immunization[8,9]:

-All HCWs who cannot document prior vaccination should receive 2 doses of MMR separated by at least 4 weeks

-Alternatively, serologic testing can determine a worker's immunity to measles and rubella

-ACIP recommends that at least 1 dose of MMR be considered for those in this group who cannot document previous measles vaccination, measles history, or laboratory evidence of immunity

Increasing HCW Immunization Rates Helps Save Lives

- Immunization protects HCWs, patients, and the community against vaccine-preventable diseases
- Immunizing HCWs against influenza can help reduce the high morbidity and mortality associated with the disease
- A single Tdap vaccine booster provides HCWs with further protection against pertussis and helps reduce transmission to vulnerable infants
- Immunization is a quality-of-care measure that helps protect us all

References: 1. Centers for Disease Control and Prevention (CDC). Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2005;54(RR-8):1-40. **2.** CDC. Influenza. In: Atkinson W, Hamborsky J, McIntyre L, Wolfe C, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book*. 9th ed. Washington, DC: Public Health Foundation; 2006:233-253. **3.** CDC. Pertussis. In: Atkinson W, Hamborsky J, McIntyre L, Wolfe C, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book*. 9th ed. Washington, DC: Public Health Foundation; 2006:79-96. **4.** Cherry JD. The epidemiology of pertussis: a comparison of the epidemiology of the disease pertussis with the epidemiology of *bordetella pertussis* infection. *Pediatrics*. 2005;115:1422-1427. **5.** CDC. National Immunization Program. ACIP votes to recommend use of combined tetanus, diphtheria and pertussis (Tdap) vaccine for adults (Advisory Committee on Immunization Practices): March 2, 2006. Available at: http://www.cdc.gov/nip/vaccine/tdap/tdap_adult_recs.pdf. Accessed March 10, 2006. **6.** CDC. Hepatitis B. In: Atkinson W, Hamborsky J, McIntyre L, Wolfe C, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases. The Pink Book*. 9th ed. Washington, DC: Public Health Foundation; 2006:207-231. **7.** Bolyard EA, Tablan OC, Williams WW, Pearson ML, Shapiro CN, Deitchman SD, and The Hospital Infection Control Practices Advisory Committee. Guidelines for infection control in health care personnel, 1998. *Am J Infect Control*. 1998;26:289-354. **8.** CDC. Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). *MMWR*. 1997;46(RR-18):1-42.
9. CDC. Recommended adult immunization schedule–United States, October 2005-September 2006. *MMWR*. 2005;54:Q1-Q4.

IMMUNIZE FIRST™
SAFEGUARDING THE HEALTH OF THE HEALTH-CARE WORKER

Vaccine-Preventable Diseases and Health-care Workers (HCWs)

Protecting Yourself, Your Patients, and Your Family Through Immunization

Influenza Immunization Rates Remain Low Among HCWs

- Influenza is still responsible for an estimated 226,000 hospitalizations and 36,000 deaths in the United States (US) annually[1]
- According to the Centers for Disease Control and Prevention (CDC), in 2003 less than half (approximately 40%) of all HCWs were immunized against influenza[1]
- HCW immunization helps minimize infection and/or transmission of influenza to your patients at higher risk for severe complications, such as[1]:
  - -Persons ≥50 years of age
  - -Infants 6-23 months of age
  - -Pregnant (or about to be) women
  - -People of any age with certain chronic medical conditions, such as asthma, heart disease, diabetes, or suppressed immune systems
- Remember: injectable influenza vaccine is inactivated, and *cannot cause influenza*[1]

Advisory Committee on Immunization Practices (ACIP) recommendations for HCW influenza vaccination[1,2]:

All HCWs should receive annual inactivated influenza vaccine

Timing: Begin in October and continue throughout the influenza season

Pertussis: Returning to Levels Not Seen in 45 Years

- According to the CDC, pertussis hit a 45-year high in 2004, with nearly 26,000 reported cases[3]—but many cases go unreported; data suggest that there are between 800,000 and 3.3 million cases among adolescents and adults per year in the US[4]
- Adolescents 11-18 years of age and adults have accounted for an increasing proportion of cases in recent years. In 2004, over 60% of cases were among persons 11 years of age and older[3]
- Adults, often unknowingly, are the primary source of pertussis infection for infants[3]
- HCWs can transmit pertussis to patients or catch it from them. So it is important to get immunized to prevent the spread of this disease
- ACIP voted to recommend a single dose of tetanus/diphtheria/acellular pertussis (Tdap) vaccine for adolescents and adults 11-64 years of age to replace a booster dose of tetanus/diphtheria toxoid (Td)[5]

ACIP recommendations for HCW Tdap vaccinations[5]:

On February 22, 2006, ACIP voted to recommend Tdap vaccine for HCWs as soon as feasible. HCWs in direct contact with infants less than 12 months of age should receive a Tdap vaccination—even if less than 10 years have passed since the last Td vaccination.

If HCWs have a high risk of contact with patients infected with pertussis, then shorter intervals between the Td and Tdap vaccinations may be used

Hepatitis B Virus (HBV): HCWs Are at Increased Risk

- In the US, approximately 3000-4000 people die annually from HBV-related cirrhosis, and an estimated 1000-1500 die from HBV-related liver cancer[6]
- HCW HBV infections declined 90% between 1985-1994, due in part to vaccine use and other prevention measures. But from 1988-1998, an estimated 100-200 HCWs died each year from HBV infection[7]
- Because HBV is transmitted by body fluids (most often blood), HCWs are at increased risk
- Actual cases could greatly outnumber reported cases[6]

ACIP recommendations for HCW HBV immunization[8]:

All workers who have a reasonable expectation of being exposed to blood at work (including custodial workers who clean areas contaminated with blood and other body fluids) should be given HBV vaccine

INACTIVATED INFLUENZA VACCINE

WHAT YOU NEED TO KNOW 2008-09

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis.

1 Why get vaccinated?

Influenza ("flu") is a contagious disease.

It is caused by the influenza virus, which can be spread by coughing, sneezing, or nasal secretions.

Other illnesses can have the same symptoms and are often mistaken for influenza. But only an illness caused by the influenza virus is really influenza.

Anyone can get influenza, but rates of infection are highest among children. For most people, it lasts only a few days. It can cause:

· fever · sore throat · chills · fatigue
· cough · headache · muscle aches

Some people get much sicker. Influenza can lead to pneumonia and can be dangerous for people with heart or breathing conditions. It can cause high fever, diarrhea and seizures in children. On average, 226,000 people are hospitalized every year because of influenza and 36,000 die – mostly elderly.

Influenza vaccine can prevent influenza.

2 Inactivated influenza vaccine

There are two types of influenza vaccine:

1. Inactivated (killed) vaccine, or the "flu shot" is given by injection into the muscle. 2. **Live, attenuated** (weakened) influenza vaccine is sprayed into the nostrils. *This vaccine is described in a separate Vaccine Information Statement.*

Influenza viruses are always changing. Because of this, influenza vaccines are updated every year, and an annual vaccination is recommended.

Each year scientists try to match the viruses in the vaccine to those most likely to cause flu that year. When there is a close match the vaccine protects most people from serious influenza-related illness. But even when the there is not a close match, the vaccine provides some protection. Influenza vaccine will *not* prevent "influenza-like" illnesses caused by other viruses.

It takes up to 2 weeks for protection to develop after the shot. Protection lasts up to a year.

Some inactivated influenza vaccine contains a preservative called thimerosal. Some people have suggested that thimerosal may be related to developmental problems in children. In 2004 the Institute of Medicine reviewed many studies looking into this theory and concluded that there is no evidence of such a relationship. Thimerosal-free influenza vaccine is available.

3 Who should get inactivated influenza vaccine?

*All children **6 months and older** and **all older adults:***

- **All children** from 6 months through 18 years of age.
- Anyone **50 years of age or older**.

*Anyone who is **at risk of complications from influenza,** or **more likely to require medical care:***

- Women who will be **pregnant** during influenza season.
- Anyone with **long-term health problems** with:
  - heart disease - kidney disease - liver disease
  - lung disease - metabolic disease, such as diabetes
  - asthma - anemia, and other blood disorders
- Anyone with a **weakened immune system** due to:
  - HIV/AIDS or other diseases affecting the immune system
  - long-term treatment with drugs such as steroids
  - cancer treatment with x-rays or drugs
- Anyone with certain **muscle or nerve disorders** (such as seizure disorders or cerebral palsy) that can lead to breathing or swallowing problems.
- Anyone 6 months through 18 years of age on **long-term aspirin treatment** (they could develop Reye Syndrome if they got influenza).
- **Residents of nursing homes** and **other chronic-care facilities**.

*Anyone who **lives with or cares for people at high risk for influenza-related complications:***

- **Health care providers.**
- **Household contacts and caregivers of children** from birth up to 5 years of age.
- **Household contacts and caregivers** of
  - people 50 years and older, or
  - anyone with medical conditions that put them at higher risk for severe complications from influenza.

Health care providers may also recommend a yearly influenza vaccination for:

- People who provide **essential community services.**
- People living in **dormitories, correctional facilities,** or under other **crowded conditions,** to prevent outbreaks.
- People at high risk of influenza complications who **travel** to the Southern hemisphere between April and September, or to the tropics or in organized tourist groups at any time.

Influenza vaccine is also recommended for anyone who wants to **reduce the likelihood of becoming ill** with influenza or **spreading influenza to others**.

4 When should I get influenza vaccine?

Plan to get influenza vaccine in October or November if you can. But getting vaccinated in December, or even later, will still be beneficial in most years. You can get the vaccine as soon as it is available, and for as long as illness is occurring in your community. Influenza can occur any time from November through May, but it most often peaks in January or February.

Most people need one dose of influenza vaccine each year. **Children younger than 9 years of age getting influenza vaccine for the first time** – or who got influenza vaccine for the first time last season but got only one dose – should get 2 doses, at least 4 weeks apart, to be protected.

Influenza vaccine may be given at the same time as other vaccines, including pneumococcal vaccine.

5 Some people should talk with a doctor before getting influenza vaccine

Some people should not get inactivated influenza vaccine or should wait before getting it.

- Tell your doctor if you have any **severe** (life-threatening) allergies. Allergic reactions to influenza vaccine are rare.
  - Influenza vaccine virus is grown in eggs. People with a severe egg allergy should not get the vaccine.
  - A severe allergy to any vaccine component is also a reason to not get the vaccine.
  - If you have had a severe reaction after a previous dose of influenza vaccine, tell your doctor.
- Tell your doctor if you ever had Guillain-Barré Syndrome (a severe paralytic illness, also called GBS). You may be able to get the vaccine, but your doctor should help you make the decision.
- People who are moderately or severely ill should usually wait until they recover before getting flu vaccine. If you are ill, talk to your doctor or nurse about whether to reschedule the vaccination. People with a **mild illness** can usually get the vaccine.

6 What are the risks from inactivated influenza vaccine?

A vaccine, like any medicine, could possibly cause serious problems, such as severe allergic reactions. The risk of a vaccine causing serious harm, or death, is extremely small.

Serious problems from influenza vaccine are very rare. The viruses in inactivated influenza vaccine have been killed, so you cannot get influenza from the vaccine.

Mild problems:

• soreness, redness, or swelling where the shot was given
• fever • aches

If these problems occur, they usually begin soon after the shot and last 1-2 days.

Severe problems:

- Life-threatening allergic reactions from vaccines are very rare. If they do occur, it is usually within a few minutes to a few hours after the shot.
- In 1976, a type of influenza (swine flu) vaccine was associated with Guillain-Barré Syndrome (GBS). Since then, flu vaccines have not been clearly linked to GBS. However, if there is a risk of GBS from current flu vaccines, it would be no more than 1 or 2 cases per million people vaccinated. This is much lower than the risk of severe influenza, which can be prevented by vaccination.

7 What if there is a severe reaction?

What should I look for?

- Any unusual condition, such as a high fever or behavior changes. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?

- **Call** a doctor, or get the person to a doctor right away.
- **Tell** your doctor what happened, the date and time it happened, and when the vaccination was given.
- **Ask** your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form.

  Or you can file this report through the VAERS web site at www.vaers.hhs.gov, or by calling 1-800-822-7967.

  VAERS does not provide medical advice.

8 The National Vaccine Injury Compensation Program

A federal program exists to help pay for the care of anyone who has a serious reaction to a vaccine.

For more information about the National Vaccine Injury Compensation Program, call **1-800-338-2382** or visit their website at **www.hrsa.gov/vaccinecompensation.**

9 How can I learn more?

- Ask your immunization provider. They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call **1-800-232-4636 (1-800-CDC-INFO)**
  - Visit CDC's website at **www.cdc.gov/flu**

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

LIVE, INTRANASAL INFLUENZA VACCINE

WHAT YOU NEED TO KNOW 2008-09

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis.

1 Why get vaccinated?

Influenza ("flu") is a contagious disease.

It is caused by the influenza virus, which can be spread by coughing, sneezing, or nasal secretions.

Other illnesses can have the same symptoms and are often mistaken for influenza. But only an illness caused by the influenza virus is really influenza.

Anyone can get influenza, but rates of infection are highest among children. For most people, it lasts only a few days. It can cause:

· fever · sore throat · chills · fatigue
· cough · headache · muscle aches

Some people get much sicker. Influenza can lead to pneumonia and can be dangerous for people with heart or breathing conditions. It can cause high fever, diarrhea, and seizures in children. On average, 226,000 people are hospitalized every year because of influenza and 36,000 die – mostly elderly.

Influenza vaccine can prevent influenza.

2 Live, attenuated influenza vaccine - LAIV (nasal spray)

There are two types of influenza vaccine:

1. **Live, attenuated** influenza vaccine (LAIV) contains live but attenuated (weakened) influenza virus. It is sprayed into the nostrils. 2. **Inactivated** influenza vaccine, sometimes called the "flu shot," is given by injection. *Inactivated influenza vaccine is described in a separate Vaccine Information Statement.*

Influenza viruses are always changing. Because of this, influenza vaccines are updated every year, and an annual vaccination is recommended.

Each year scientists try to match the viruses in the vaccine to those most likely to cause flu that year. When there is a close match the vaccine protects most people from serious influenza-related illness. But even when the there is not a close match, the vaccine provides some protection. Influenza vaccine will *not* prevent "influenza-like" illnesses caused by other viruses.

It takes up to 2 weeks for protection to develop after the vaccination. Protection lasts up to a year.

LAIV does not contain thimerosal or other preservatives.

3 Who can get LAIV?

LAIV is approved for **people from 2 through 49 years of age**, who are not pregnant and do not have certain health conditions (see #4, below). Influenza vaccination is recommended for people who can spread influenza to others at high risk, such as:

- **Household contacts and out-of-home caregivers** of children up to 5 years of age, and people 50 and older.
- Physicians and nurses, and family members or anyone else in **close contact with people at risk** of serious influenza.

Health care providers may also recommend a yearly influenza vaccination for:

- People who provide **essential community services.**
- People living in **dormitories, correctional facilities,** or under other crowded conditions, to prevent outbreaks.

Influenza vaccine is also recommended for anyone who wants to **reduce the likelihood of becoming ill** with influenza or **spreading influenza to others**.

4 Some people should *not* get LAIV

LAIV is not licensed for everyone. The following people should get the **inactivated** vaccine (flu shot) instead:

- **Adults 50 years of age and older** or **children between 6 months and 2 years of age.** (Children younger than 6 months should not get *either* influenza vaccine.)
- Children younger than 5 with asthma or one or more episodes of **wheezing** within the past year.
- People who have **long-term health problems** with:
  - heart disease
  - lung disease
  - asthma
  - kidney or liver disease
  - metabolic disease, such as diabetes
  - anemia, and other blood disorders
- Anyone with certain **muscle or nerve disorders** (such as seizure disorders or cerebral palsy) that can lead to breathing or swallowing problems.
- Anyone with a **weakened immune system**.
- Children or adolescents on **long-term aspirin treatment**.
- **Pregnant women**.

Tell your doctor if you ever had **Guillain-Barré syndrome** (a severe paralytic illness also called GBS). You may be able to get the vaccine, but your doctor should help you make the decision.

The flu shot is preferred for people (including health-care workers, and family members) in **close contact with anyone**

who has a severely weakened immune system (requiring care in a protected environment, such as a bone marrow transplant unit). People in close contact with those whose immune systems are less severely weakened (including those with HIV) may get LAIV.

Anyone with a **nasal condition** serious enough to make breathing difficult, such as a very stuffy nose, should get the flu shot instead.

Some people should talk with a doctor before getting *either* influenza vaccine:

- Anyone who has ever had a serious allergic reaction to **eggs** or another vaccine component, or to a **previous dose** of influenza vaccine. LAIV also contains **MSG**, **arginine**, **gentamicin**, and **gelatin**.
- People who are moderately or severely ill should usually wait until they recover before getting flu vaccine. If you are ill, talk to your doctor or nurse about whether to reschedule the vaccination. People with a **mild illness** can usually get the vaccine.

5 When should I get influenza vaccine?

Plan to get influenza vaccine in October or November if you can. But getting it in December, or even later, will still be beneficial most years. You can get the vaccine as soon as it is available, and for as long as illness is occurring in your community. Influenza can occur from November through May, but it most often peaks in January or February.

Most people need one dose of influenza vaccine each year. **Children younger than 9 years of age getting influenza vaccine for the first time** – or who got influenza vaccine for the first time last season but got only one dose – should get 2 doses, at least 4 weeks apart, to be protected.

LAIV may be given at the same time as other vaccines.

6 What are the risks from LAIV?

A vaccine, like any medicine, could possibly cause serious problems, such as severe allergic reactions. The risk of a vaccine causing serious harm, or death, is extremely small.

Live influenza vaccine viruses rarely spread from person to person. Even if they do, they are not likely to cause illness.

LAIV is made from weakened virus and does not cause influenza. The vaccine *can* cause mild symptoms in people who get it (see below).

Mild problems:
Some children and adolescents 2-17 years of age have reported mild reactions, including:

- runny nose, nasal congestion or cough
- fever
- headache and muscle aches
- wheezing
- abdominal pain or occasional vomiting or diarrhea

Some adults 18-49 years of age have reported:

- runny nose or nasal congestion
- sore throat
- cough, chills, tiredness/weakness
- headache

These symptoms did not last long and went away on their own. Although they can occur after vaccination, they may not have been caused by the vaccine.

Severe problems:

- Life-threatening allergic reactions from vaccines are very rare. If they do occur, it is usually within a few minutes to a few hours after the vaccination.
- If rare reactions occur with any product, they may not be identified until thousands, or millions, of people have used it. Millions of doses of LAIV have been distributed since it was licensed, and no serious problems have been identified. Like all vaccines, LAIV will continue to be monitored for unusual or severe problems.

7 What if there is a severe reaction?

What should I look for?

- Any unusual condition, such as a high fever or behavior changes. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?

- **Call** a doctor, or get the person to a doctor right away.
- **Tell** your doctor what happened, the date and time it happened, and when the vaccination was given.
- **Ask** your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form.

  Or you can file this report through the VAERS website at www.vaers.hhs.gov, or by calling 1-800-822-7967.

  VAERS does not provide medical advice.

8 The National Vaccine Injury Compensation Program

A federal program exists to help pay for the care of anyone who has a serious reaction to a vaccine.

For more information about the National Vaccine Injury Compensation Program, call **1-800-338-2382** or visit their website at **www.hrsa.gov/vaccinecompensation.**

9 How can I learn more?

- Ask your immunization provider. They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call **1-800-232-4636 (1-800-CDC-INFO)**
  - Visit CDC's website at **www.cdc.gov/flu**

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

INFLUENZA VACCINE ADMINISTRATION RECORD:

"I have read or have had explained to me the information in the Vaccine Information Statement about the influenza vaccine. I have had a chance to ask questions that were answered to my satisfaction. I believe I understand the benefits and risks of the vaccine(s) listed below and ask that the vaccine(s) be given to me or to the person named below for whom I am authorized to make this consent."

Information about the person to receive vaccine – **PLEASE PRINT**

Name:

_____ /_____ /_____

Last First Middle Initial Birthdate Age

Address:

_____ _____ _____

Street City County State Zip

Signature of person to receive vaccine or person authorized to make the request:

X_____ Date:_____

Clinic/Office Address:	
VIS(s) given to patient? (Please initial)	Date of VIS: ❒ **7/24/08 (Inactivated)** ❒ **7/24/08 (LAIV)**
Vaccine Given:	❒ **Inactivated**_____ ❒ **Live (LAIV)**
Date Vaccine Administered:	
Vaccine Manufacturer:	❒ **Inactivated**_____ ❒ **MedImmune (LAIV)**
Vaccine Lot Number:	
Administration Site:	❒ **Injection Site**_____ ❒ **Intranasal**
Signature and Title of Vaccine Administrator:	

Declination of Influenza Vaccination

My employer or affiliated health facility, _____, has recommended that I receive influenza vaccination in order to protect myself and the patients I serve.

I acknowledge that I am aware of the following facts:

- Influenza is a serious respiratory disease that kills an average of 36,000 persons and hospitalizes more than 200,000 persons in the United States each year.
- Influenza vaccination is recommended for me and all other healthcare workers to prevent influenza disease and its complications, including death.
- If I contract influenza, I will shed the virus for 24–48 hours before influenza symptoms appear. My shedding the virus can spread influenza infection to patients in this facility.
- If I become infected with influenza, even when my symptoms are mild, I can spread severe illness to others.
- I understand that the strains of virus that cause influenza infection change almost every year, which is why a different influenza vaccine is recommended each year.
- I cannot get the influenza disease from the influenza vaccine.
- The consequences of my refusing to be vaccinated could endanger my health and the health of those with whom I have contact, including
  - patients in this healthcare setting
  - my coworkers
  - my family
  - my community

Despite these facts, I am choosing to decline influenza vaccination right now.

I understand that I may change my mind at any time and accept influenza vaccination, if vaccine is available.

I have read and fully understand the information on this declination form.

Signature: _____ Date: _____

Name (print): _____

Department: _____

Technical content reviewed by the Centers for Disease Control and Prevention, September 2007.

www.immunize.org/catg.d/p4068.pdf • Item #P4068 (9/07)

Sample Declination Form

Declination: I understand that, because I work in a health care environment, I may place patients and co-workers at risk if I work while infected with influenza. Although I have been informed of the risks and benefits of the vaccine, I am giving up my right to be vaccinated and declining the vaccine at this time. I understand that by declining this vaccine, I will be at risk of acquiring influenza and spreading it to others.

Reason(s) I do not wish to take the vaccine. Check all that apply.

- ❒ I never get the Flu
- ❒ Don't feel I need to take the vaccine
- ❒ I will get the Flu if I receive the vaccine
- ❒ I had side effects after I had the vaccine - so I won't take it again
- ❒ I stay home when I'm sick so I won't spread it to patients or colleagues
- ❒ I'm allergic to eggs
- ❒ I have had Guillain-Barre Syndrome
- ❒ Other _____

I understand that this declination can be null and void if I change my mind.

_____ _____

Print name Date

_____

Signature

2008 Maryland Supplement

Healthcare Workers and Tdap Vaccination

Facts About Pertussis for Adults

What is pertussis?

Pertussis, also known as whooping cough, is a serious infection that spreads easily from person to person. The infection causes coughing spells so severe that it can be hard to breathe, eat or sleep. It can even lead to cracked ribs, pneumonia or hospitalization.

Pertussis has been on the rise in the United States since an all-time low of just over 1,000 cases were reported in 1976. While 25,616 cases were reported to the U.S. Centers for Disease Control and Prevention (CDC) in 2005, the vast majority of cases go unreported and some estimates of true incidence range from one to three million cases annually.

Symptoms

Early symptoms of pertussis are similar to the common cold or bronchitis and may include runny nose, sneezing and low-grade fever. The infection also causes coughing that lasts for weeks, even months. Sometimes a "whoop" sound occurs while gasping for breath during a bad coughing spell. However, the "whoop" is not always present; adults rarely have the classic "whoop."

Prevention

Whooping cough is most contagious before the coughing starts, so the most effective way to prevent it is through immunization. The whooping cough booster vaccine for adults (and adolescents) is called Tdap (tetanus-diphtheria-acellular pertussis). Children get a different formulation, called DTaP. Both protect against tetanus, diphtheria and pertussis.

Two Tdap vaccines are currently licensed for use in the U.S. One preparation can be used for both adults and adolescents, and the other has been approved for use only in adolescents:

- ADACEL (sanofi pasteur) for use in persons 11 to 64 years of age
- Boostrix (GlaxoSmithKline) for use in persons 10 to 18 years of age

Who should get the Tdap vaccine?

The CDC recommends that adults 19 to 64 years of age (and adolescents 11 to 18 years of age) receive a single dose of Tdap in place of the Td (tetanus-diphtheria) booster previously recommended for all adults and adolescents. In addition, the CDC has issued recommendations for specific adult populations:

- Adults who have or who anticipate having close contact with infants younger than 12 months of age. (e.g., parents, grandparents younger than 65 years of age, childcare providers, healthcare workers)
- Healthcare personnel in hospitals or ambulatory care settings who have direct patient contact. Priority is given to vaccination of workers in direct contact with infants younger than 12 months of age.
- Pregnant women after delivery, before discharge from the hospital or birthing center.

Vaccine Safety

The Tdap vaccine is safe. Reactions to the vaccine are usually mild. The most common reactions after vaccination are pain and redness at the injection site. Other adverse events are possible. Please consult with your doctor. A healthcare professional should be informed if you have developed Guillain-Barré syndrome within six weeks following a prior tetanus vaccination, if you are pregnant or nursing, or if you have experienced Arthus-type hypersensitivity reactions (i.e., rare but severe, exaggerated local reactions) following a prior tetanus vaccine.

National Foundation for Infectious Diseases
4733 Bethesda Avenue, Suite 750, Bethesda, MD 20814
(301) 656-0003. Web site: www.nfid.org January 2008

Facts About Pertussis for Adults

FACT: Pertussis is a serious infectious disease that has been on the rise in the United States over the last decade, across all age groups.

FACT: Protection against pertussis from early childhood vaccines wears off, leaving adults and adolescents at risk for infection.

FACT: The Chinese refer to pertussis as the "cough of 100 days" due to the prolonged, dry cough that is experienced by infected individuals.

FACT: Pertussis can be difficult to diagnose because early symptoms may appear like the common cold or bronchitis.

FACT: Pertussis causes coughing spells that can affect breathing, eating and sleeping. It can even lead to cracked ribs and hospitalization.

FACT: Pertussis causes coughing that lasts for weeks, even months. Sometimes a "whoop" sound occurs while gasping for breath during a bad coughing spell. However, the "whoop" is not always present; adults rarely have the classic "whoop."

FACT: The vast majority of cases are not reported. While 25,616 cases of pertussis were reported to the U.S. Centers for Disease Control and Prevention in 2005, experts estimate that the true number may actually be one to three million cases annually.

FACT: Adults and adolescents can spread pertussis to infants who have not yet had all of their vaccines, even before a cough develops.

FACT: Parents, grandparents and older siblings are often the source of pertussis in babies.

FACT: A booster vaccine, known as Tdap (tetanus-diphtheria-acellular pertussis), is available to protect against pertussis. One formulation can be used for adults and adolescents. The other has been approved for adolescents only.

FACT: The pertussis booster vaccine protects against two other highly infectious diseases—tetanus and diphtheria.

FACT: The CDC recommends that adults 19 to 64 years of age (and adolescents 11 to 18 years of age) receive a single dose of Tdap in place of the Td (tetanus-diphtheria) booster previously recommended for all adults.

FACT: The CDC also recommends that adults in close contact with infants younger than 12 months of age, healthcare personnel with direct patient contact — especially with infants younger than 12 months of age — and pregnant women directly after delivery receive a single dose of Tdap.

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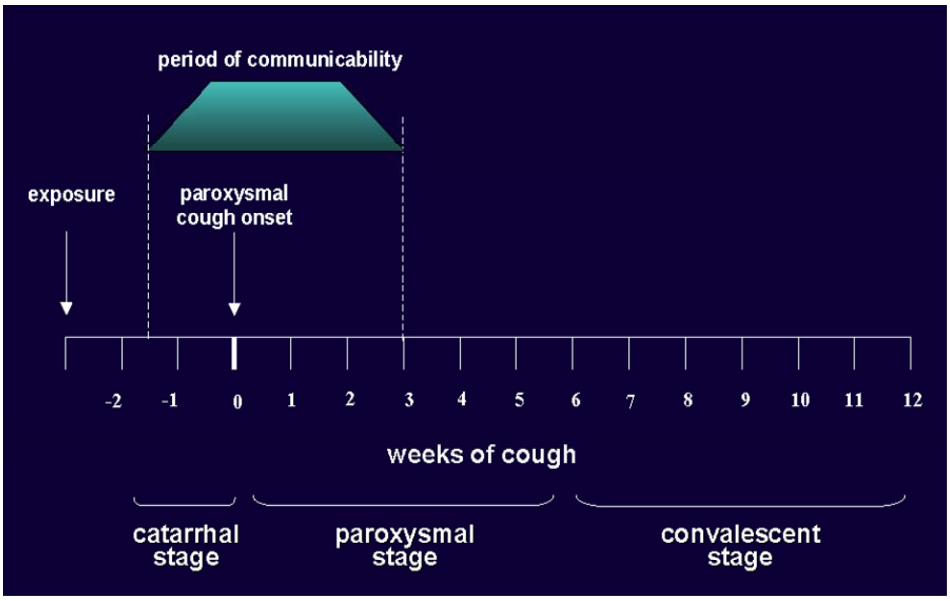
Pertussis Becomes Communicable Before the Onset of Paroxysmal Cough[1]



Reference: 1. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Disease*. 2007;81-100.

Pertussis Cases Among Infants Occur in the Very Youngest[1]

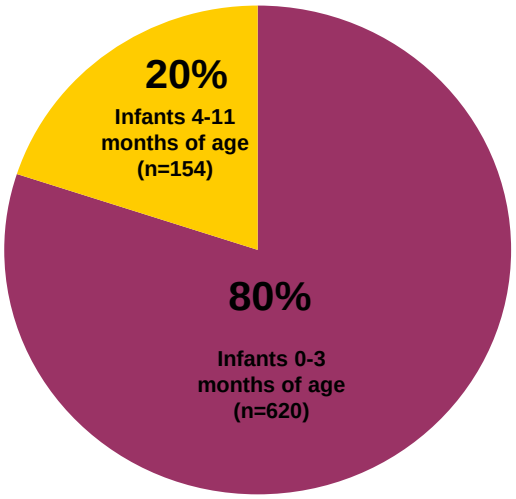
Proportion of pertussis cases among infants less than 1 year of age

Findings from a CDC study:

Infants 0-3 months of age were significantly more likely to be hospitalized or to have apnea than were infants 4-11 months of age

Vulnerability to pertussis:

Children do not complete their infant diphtheria, tetanus, and acellular pertussis (DTaP) series until 6 months of age or later



References: 1. Bisgard KM, et al. *Pediatr Infect Dis J*. 2004;23:985-989

For more information about vaccination of healthcare workers, go to: http://www.cdc.gov/vaccines/spec-grps/hcw.htm

Initiative Supporting Partners

A special thanks to our Supporting Partners:

American Academy of Pediatrics, Maryland Chapter

Anne Arundel Community College School of Nursing

Health Facilities of Maryland (HFAM)

Maryland AIDS Administration

Maryland Alcohol and Drug Abuse Administration

Maryland Board of Nursing

Maryland Hospital Association

MedChi, Maryland Medical Society

Salisbury University School of Nursing

Statewide Advisory Commission on Immunization

If you would like to become a partner in the Maryland Healthcare Workers Influenza Initiative, please email info@immunizemaryland.org or call Tiffany Tate at 410-902-4677.

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