

Providing a Safer Environment for Health Care Personnel and Patients Through Influenza Vaccination

INFLUENZA VACCINATION



Strategies from Research and Practice

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The Joint Commission Mission

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The Strategies for Implementing Successful Influenza Immunization Programs for Health Care Personnel Project staff are solely responsible for the content of this monograph. The findings and conclusions in this report are those of the authors and do not necessarily represent the position of the Centers for Disease Control and Prevention or any of the other collaborating organizations.

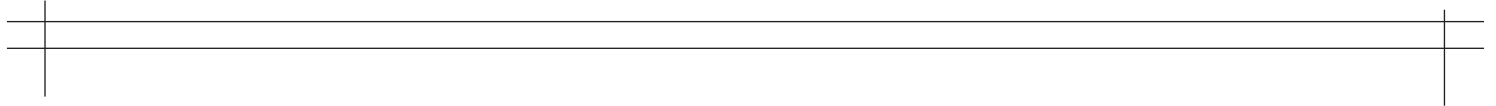
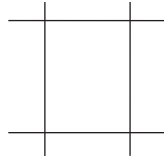
Many of the examples included come from self-reported strategies and data submitted by health care organizations to this project, as well as published literature. The examples included herein are intended to aid health care organizations in their efforts to improve influenza immunization rates in their health care personnel. We have worked to ensure that this monograph contains relevant information. In addition, because the information contained herein is derived from many sources, The Joint Commission and its collaborating organizations are not responsible for any claims or losses arising from the use of, or from any errors or omissions in, this monograph.

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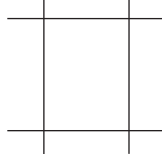


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We would be remiss if we did not recognize the hundreds of individuals committed to influenza vaccination who submitted examples of their programs for the project, only a fraction of whom are mentioned in this document.

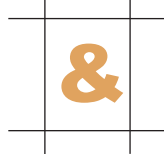
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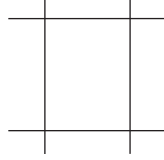
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INTRODUCTION



Transmission of influenza to patients by health care personnel (HCP) is well documented.¹ HCP may acquire influenza both in the health care setting and in the community, and they can easily transmit the virus to patients in their care. Yet, the Centers for Disease Control and Prevention (CDC) estimates that only about 40% of HCP in the United States are vaccinated against influenza annually.² With up to 20% of unvaccinated individuals developing influenza each year,³ a large proportion of unvaccinated HCP could succumb to influenza, thereby raising the risk of transmitting the virus to susceptible patients.

Health care organization leaders and staff need to mount a concerted effort to improve influenza immunization rates among HCP. Increasing influenza vaccination rates among HCP would reduce the burden of the disease and its associated health care costs. The purpose of this monograph is to highlight immunization strategies organizations have used to vaccinate HCP that can serve as models for others. This monograph also provides a comprehensive review of current recommendations from a number of

sources and a summary of guidelines, legislative/regulatory efforts, position papers, and accreditation considerations.

The 10-month project “Strategies for Implementing Successful Influenza Immunization Programs for Health Care Personnel” (described briefly in Text Box I-1 on page viii) began in September 2008 and was funded by an educational grant from sanofi pasteur. The goal of the project was to develop a monograph that included information about influenza and the influenza vaccine, barriers to successful programs and strategies for overcoming them, and examples of successful initiatives organizations have used to improve their influenza immunization rates. Organizations that responded to the open call to participate in the project’s survey and that were chosen for inclusion in this monograph are highlighted in Chapter 3 and listed in Appendix I-1, pages xii–xiii.

Definition of Health Care Personnel

For the purposes of this monograph, the term *health care personnel (HCP)* is defined broadly as all paid and unpaid persons working in health care settings who have the

Text Box I-1. **Project Overview**

In November 2008 The Joint Commission sent out a call for immunization practices from organizations that considered their approach to vaccinating their health care personnel (HCP) against influenza to be successful in improving HCP influenza vaccination rates.* An editorial review panel, which included a representative from each of the collaborating organizations, helped project staff identify criteria for evaluating the submitted approaches.

The Joint Commission received a total of 229 submissions representing clinics, boards of health, health care systems, home health care organizations, hospitals, long term care facilities, pharmacies, and prisons. Although submissions were primarily from the United States, submissions were also received from Canada, Israel, Italy, Saudi Arabia, Singapore, the United Arab Emirates, and the Virgin Islands.

After each submission was reviewed for completeness and additional materials were collected from the organizations, as needed, each was reviewed against the criteria by a Ph.D. prepared nurse. Fifty submissions were then reviewed by a masters-prepared nurse who is also certified in infection control (C.I.C.). Finally, 36 submissions were advanced to the Editorial Review Panel, and 28 submissions were ultimately selected for inclusion in the monograph.

Regrettably, we were unable to determine the exact changes in immunization rates between submitting organizations, due to variations in how the different organizations calculated their immunization acceptance rates. The immunization rates for submitting organizations ranged from 30% to 99%. The most successful organizations used multiple approaches to increase their rates and involved myriad individuals, including clinical and nonclinical personnel working together across departments.

* *The words vaccination and immunization are used interchangeably throughout this monograph.*

potential for exposure to infectious materials. The full range of HCP work in a variety of settings, including acute care hospitals, long term care facilities, skilled nursing facilities, rehabilitation centers, physician's offices, urgent care centers, outpatient clinics, home health care agencies, and emergency medical services. Some HCP provide direct patient care. Others, such as housekeepers, maintenance staff, vendors, volunteers, or outside contractors, have jobs that may put them into close contact with patients or the patient environment. Even HCP who do not come into close contact with patients are likely to have some contact with HCP who do—for example, by passing them in a hallway or eating in the same cafeteria with them.

Which HCP will you include in your immunization program? Consider this important question carefully. As noted above, HCP include a range of those directly, indirectly, and not involved in patient care. Many have the potential for exposure to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. Talbot et al. found differences in the way organizations defined HCP in their national survey of 50 hospitals' HCP influenza immunization programs: About two-thirds of the hospitals included physicians, approximately half included volunteers and agency staff, and one-third included medical students.⁴ This is a particularly important concept to keep in mind when comparing influenza rates over time within a health care organization (that is, were groups of HCP added or removed from an organization's definition?) and between organizations (that is, are the same groups of HCP included in each organization's definition?).

Influenza Morbidity, Mortality, and Costs

Influenza is a contagious viral infection of the respiratory tract that is easily spread from person to person via respiratory droplets when an infected person coughs or sneezes, or when someone touches a surface contaminated with the virus. Airborne transmission of the virus is also believed to be possible, although data to support this mode of transmission are limited.²

As the following U.S. statistics demonstrate, morbidity, mortality, and the economic impact from influenza each year have been substantial:

- Each year, between 5% and 20% of the population becomes ill with influenza.³
- Between 1990 and 1999, approximately 36,000 influenza-associated deaths occurred each year, making it the sixth leading cause of death among adults in the United States.⁵
- More than 200,000 hospitalizations due to influenza occurred each year between 1979 and 2001.⁶
- Using a probability model, Molinari et al. estimated that annual influenza epidemics contribute to 610,660 life-years lost, 3.1 million days of hospitalization, and 31.4 million outpatient visits.⁷
- Rates of serious illness and death resulting from influenza and its complications are notably increased in high-risk populations, such as men and women older than 65, children younger than 2, and persons of any age who have underlying conditions that put them at an increased risk.²

Why HCP Should Be Immunized Against Influenza

The transmission of influenza in health care settings is a major concern because HCP who have acquired influenza can easily spread the infection to patients in their care. Influenza immunization is the most effective way to prevent influenza virus infection and its complications,² providing 70% to 90% protection against the infection in healthy adults.^{8,9} In populations in which the vaccine is less effective in preventing influenza, such as the elderly, it reduces the severity of the disease and the incidence of complications by 50% to 60% and deaths by approximately 80%.¹⁰ Nichol et al. found a significant association between working adults aged 50–64 who received the vaccination and a reduction in influenza-like illness, fewer days of illness and absenteeism, and a decrease in impaired work performance during the influenza season.¹¹

Since 1984 the CDC's Advisory Committee on Immunization Practices has recommended that all HCP be immunized against influenza.¹² Vaccination rates of 80% or higher may be needed to provide the "herd immunity" that prevents health care–associated influenza by immunizing those who care for and live with susceptible patients who

may not develop an optimal protective response to the influenza immunization.^{13,14} Immunization rates among HCP increased from 10% to 40% between 1989 and 2003,¹ but since 1997 have been at a fairly consistent national average of about 42%.² Even in health care organizations that have aggressive, multifaceted influenza vaccination campaigns, often 30% to 50% of HCP are unvaccinated.¹⁵

The rationale for immunizing HCP against influenza includes the following:

- The vaccine is effective in preventing influenza.
- Immunized HCP minimize the risk of transmission not only to patients but also to coworkers and family members. It is important to be aware that adults shed the infectious influenza virus at least 1 day before any symptoms appear and continue to do so for 5 to 10 days after symptoms begin.² Noteworthy, too, is that approximately 50% of influenza infections can be asymptomatic, and both symptomatic and asymptomatic individuals can shed the virus and be a source of infection to others.^{9,13,16} Wilde et al. reported results from a serosurvey of HCP in which 23% had documented serologic evidence of having had an influenza infection during a mild influenza season; however, more than 50% of those surveyed could not recall having had influenza, and more than 25% could not recall having had any respiratory infection.⁸
- Influenza immunization reduces HCP absenteeism.^{2,8} Immunized HCP are protected from patients, coworkers, or family members who are ill with influenza and are therefore at reduced risk of illness that could keep them from working. Many see this as a patient safety issue: Absenteeism decreases the number of essential HCP available to take care of patients, thereby affecting the delivery of care.¹⁷
- Influenza immunization reduces HCP "presenteeism," or not fully functioning when working when ill.^{18–20} (The term *presenteeism* was coined by Professor Cary Cooper, a psychologist specializing in organizational management at Manchester University in the United Kingdom, to refer to the opposite of absenteeism.) A CDC survey of working adults published in 2004 revealed that nearly 83% of study participants acknowledged that they worked or

attended school while they had an influenza-like illness.²¹ Because influenza is a contagious disease, coming to work with an influenza-like illness puts others at risk.

- Achieving HCP vaccination levels of 60% or higher is a Healthy People 2010 goal.²²

The chapters that follow provide more detailed information:

- Chapter 1 reviews issues surrounding the influenza vaccine, including the vaccine's effectiveness; timing considerations, such as when to begin vaccinating HCP and how long to continue the vaccinations; and considerations related to vaccine supply.
- Chapter 2 focuses on influenza vaccination rates among HCP and factors influencing their acceptance of vaccination, issues surrounding mandatory influenza vaccinations for HCP, and the impact of institutional outbreaks.
- Chapter 3 describes strategies that have been useful in improving influenza vaccination rates among HCP, with specific examples of how organizations have applied those strategies.
- Chapter 4 presents an overview of many of the existing initiatives, position papers, guidelines, and legislative, regulatory, and accreditation efforts related to improving the rate of influenza immunization among HCP.

A glossary of terms used in this monograph can be found in Appendix I-2, pages xiv–xvi.

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Appendix I-1. Submitting Organizations Highlighted in the Monograph

Submitting Organization	Health Care Organization Contact
Albert Einstein Healthcare Network Philadelphia, Pennsylvania	Infection Prevention and Control Department Phone: 215/456-6627
Beaufort Memorial Hospital Beaufort, South Carolina	Employee Health Phone: 843/522-5652
Campbell County Memorial Hospital Gillette, Wyoming	Employee Health Services Phone: 307/688-6008
Catawba Service Unit Rock Hill, South Carolina	Case Management Phone: 803/366-9090, ext. 240
CentraState Healthcare System Freehold, New Jersey	Employee Health Phone: 732/294-2712
Chattanooga-Hamilton County Health Dept Chattanooga, Tennessee	Special Projects Phone: 423/209-8236
Cigna Medical Group, CIGNA HealthCare of Arizona Phoenix, Arizona	Employee Health Services Phone: 602/861-6334
Cleveland Clinic Cleveland, Ohio	Infection Control Phone: 216/444-0118
Community Health Care, Inc. Davenport, Iowa	Quality Department Phone: 563/336-3000
The Drake Center Cincinnati, Ohio	Quality & Performance Improvement Department Phone: 513/418-2891
Franciscan Health System Tacoma, Washington	Dept. of Infection Prevention/Employee Health Phone: 253/426-6727
Good Samaritan Hospital Medical Center West Islip, New York	Employee Health Services Phone: 631/376-4135
Hospital of the University of Pennsylvania Philadelphia, Pennsylvania	Occupational Medicine Phone: 215/662-2367
Lebanon VA Medical Center Lebanon, Pennsylvania	Quality Management/Infection Control Phone: 717/272-6621, ext. 4012

Appendix I-1. *Continued* Submitting Organizations Highlighted in the Monograph

Submitting Organization	Health Care Organization Contact
Loyola University Health System Maywood, Illinois	Primary Care Quality Improvement Phone: 708/216-2348
NorthBay Healthcare Group Fairfield, California	Employee Health Phone: 707/646-4605
Rome Memorial Hospital Rome, New York	Infection Prevention Phone: 315/338-7121
Sanford Medical Center Sioux Falls, South Dakota	Employee Health Services Phone: 605/333-3133
Spencer Hospital Spencer, Iowa	Infection Control Phone: 712/264-6143
St. John's Regional Medical Center Joplin, Missouri	Employee Health Phone: 417/625-6541
St. Joseph's Hospital Buckhannon, West Virginia	Employee Health Phone 304/473-2184
St. Louis University Hospital (Tenet) St. Louis, Missouri	Employee Health Phone: 314/268-5499
St. Luke's Duluth, Minnesota	Infection Control/Quality Management Phone: 218/249-5608
Stamford Hospital Stamford, Connecticut	Department of Infectious Diseases Phone: 203/276-7487
S.U.N.Y. Upstate Medical University Syracuse, New York	Employee/Student Health Phone: 315/464-4260
Tri-City Regional Medical Center Hawaiian Gardens, California	Quality Management Phone: 562/860-0401, ext. 280
Upper Chesapeake Health Bel Air, Maryland	Occupational Health Phone: 443/643-3422
Wisconsin Division of Public Health Madison, Wisconsin	Bureau of Communicable Diseases Epidemiology Section Phone: 608/267-7711

Appendix I-2. Glossary of Key Terms Used in This Monograph

Term	Definition
Antigenic drift¹	Small, gradual changes that occur in influenza viruses, resulting from mutations during viral replication. Antigenic drift produces new virus strains that may not be recognized by antibodies to earlier influenza strains. It is the virologic basis for seasonal epidemics and is the reason for annually reassessing the need to change one or more of the recommended strains included in the licensed influenza vaccines.
Effectiveness²	The prevention of illness in immunized populations.
Efficacy²	The prevention of illness among persons immunized in clinical trials.
Hand hygiene³	A general term that applies to any one of the following: Hand washing with (1) plain (nonantimicrobial) soap and water; (2) antiseptic handwash (soap containing antiseptic agents and water); or (3) antiseptic hand rub (waterless antiseptic product, most often alcohol-based, rubbed on all surfaces of hands).
Health care–associated infection (HAI)³	An infection that develops in a patient who is cared for in any setting where health care is delivered (for example, acute care hospital, chronic care facility, ambulatory clinic, dialysis center, surgical center, home) and is related to receiving health care (that is, was not incubating or present at the time health care was provided). In ambulatory and home settings, HAI would apply to any infection that is associated with a medical or surgical intervention.
Health care personnel (HCP)⁴	All paid and unpaid persons working in health care settings who have the potential for exposure to infectious materials. The full range of HCP work in a variety of settings, including acute care hospitals, long term care facilities, skilled nursing facilities, rehabilitation centers, physicians' offices, urgent care centers, outpatient clinics, home health care agencies, and emergency medical services. Some HCP provide direct patient care. Others, such as housekeepers, maintenance staff, vendors, volunteers, or outside contractors, have jobs that may put them into close contact with patients or the patient environment.
Herd immunity⁵	The immunity of a group or community. The resistance of a group to invasion and spread of an infectious agent, based on the resistance to infection of a high proportion of individual members of the group.
Immunocompromised patients³	Patients whose immune mechanisms are deficient because of congenital or acquired immunologic disorders (for example, HIV infection, congenital immune deficiency syndromes), chronic diseases such as diabetes mellitus, cancer, emphysema, or cardiac failure, critical care, malnutrition, and immunosuppressive therapy of another disease process (for example, radiation, cytotoxic chemotherapy, anti-graft rejection medication, corticosteroids, monoclonal antibodies directed against a specific component of the immune system). Immunocompromised states make it more difficult to diagnose certain infections (for example, tuberculosis) and are associated with more severe clinical disease states than with persons who have the same infection and a normal immune system.

Appendix I-2. Continued

Glossary of Key Terms Used in This Monograph

Term	Definition
Infection Preventionist³	A person whose primary training is either in nursing, medical technology, microbiology, or epidemiology and who has acquired special training in infection prevention and control. Responsibilities may include collection, analysis, and feedback of infection data and trends to health care providers; consultation on infection risk assessment, prevention, and control strategies; performance of education and training activities; implementation of evidence-based infection control practices or those mandated by regulatory and licensing agencies; application of epidemiologic principles to improve patient outcomes; evaluation of new products or procedures on patient outcomes; oversight of employee health services related to infection prevention; implementation of preparedness plans; communication within the health care setting, with local and state health departments, and with the community at large concerning infection control issues; and participation in research. Certification in infection control (C.I.C.) is available through the Certification Board of Infection Control and Epidemiology (formerly known as Infection Control Professionals prior to July 10, 2008 ⁶).
Influenza-like illness (ILI)⁷	Defined by the Centers for Disease Control and Prevention U.S. Outpatient Influenza-Like Illness Surveillance Network (ILINet) as fever > 100.4°F (37.8°C) plus cough and/or sore throat in the absence of a known cause.
Live, attenuated influenza vaccine (LAIV)²	An influenza vaccine that contains live, attenuated (weakened) influenza virus and is administered intranasally by sprayer; it can be used for healthy, nonpregnant persons 2–49 years of age.
Outbreak⁵	Synonymous with epidemic, the occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time.
Presenteeism⁸	The problem of lost productivity that occurs when employees are present at the work site but, because of illness or other medical condition, are not fully functioning.
Public reporting⁹	Providing the public with information about the performance or quality of health services or systems for the purpose of improving the performance or quality of the services or systems.
Standard Precautions³	A group of infection prevention practices that apply to all patients, regardless of suspected or confirmed diagnosis or presumed infection status. Standard Precautions are based on the principle that all blood, body fluids, secretions, excretions except sweat, nonintact skin, and mucous membranes may contain transmissible infectious agents. Standard Precautions include hand hygiene and the use of gloves, gowns, masks, eye protection, or face shields (depending on the anticipated exposure). Also, equipment or items in the patient environment likely to have been contaminated with infectious materials must be handled in a manner to prevent transmission of infectious agents (for example, wear gloves for handling, contain heavily soiled equipment, properly clean and disinfect or sterilize reusable equipment before use on another patient).
Surveillance⁹	The ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event to reduce morbidity and mortality and to improve health.
Trivalent inactivated influenza vaccine (TIV)²	An influenza vaccine that contains killed influenza virus and is administered intramuscularly by injection; it can be used for any person aged > 6 months, including those with high-risk conditions.

Continued

Appendix I-2. Continued Glossary of Key Terms Used in This Monograph

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1. Adapted from Centers for Disease Control and Prevention: *Influenza Viruses*. <http://www.cdc.gov/flu/avian/gen-info/flu-viruses.htm> (accessed Apr. 3, 2009).
2. Adapted from Fiore A.E., et al.: Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008. *MMWR Recomm Rep* 57:1–60, Aug. 8, 2008. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5707a1.htm> (accessed Nov. 17, 2008)
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Vaccine Administration Considerations

While the majority of cases of serious illness and death from influenza occur primarily in high-risk persons (those older than 65, children younger than 2 years of age, and persons of any age who have underlying medical conditions that put them at increased risk),¹ influenza can affect all age groups. In any given influenza season, researchers estimate that between 5% and 20% of the population will become ill from influenza.² Because high concentrations of persons at increased risk for complications from the disease are found in health care settings, immunization of health care personnel is an effective means of preventing transmission to such persons in these settings.^{1,3} This chapter examines the effectiveness of the vaccine in reducing the transmission of influenza among HCP, timing considerations, similarities and differences between the vaccines, and vaccine supply issues.

Vaccine Effectiveness, Decreasing Transmission of Illness

Studies of vaccine efficacy (the prevention of illness among persons immunized in clinical trials) and effective-

ness (the prevention of illness in immunized populations) have used different outcomes, which influences the way results are interpreted.¹ Studies providing specific outcomes, such as laboratory-confirmed tests for the influenza virus, can provide better estimates of the impact of influenza vaccine in preventing disease than studies with nonspecific outcomes (such as influenza-like illness that may include illnesses not caused by influenza).¹ According to the Centers for Disease Control and Prevention (CDC), in the years when circulating influenza viruses and the vaccine are well matched, the vaccine can be expected to reduce laboratory-confirmed influenza by as much as 70% to 90% in healthy adults who are younger than age 65.¹ A number of studies have also found reductions in febrile illness, absenteeism due to influenza, use of antibiotics, and visits to physicians' offices. Examples of such studies include the following:

- Jefferson et al. reviewed 38 studies, evaluating the effects of the vaccine (efficacy, effectiveness, and harm) against influenza in healthy adults. They concluded that the vaccine was 80% effective in reducing the number of cases of influenza, particularly when the vaccine strains were well matched to strains of influenza in circulation. Even

when the vaccine was not well matched, they found that the vaccine's effectiveness was 50% overall.⁴

- Nichol et al. evaluated the effectiveness of the intranasally administered live, attenuated influenza vaccine (LAIV) in healthy adults during the 1997–1998 influenza season, a year in which the vaccine was not well matched with the predominant circulating strain. These researchers found that the vaccine reduced the incidence of self-reported flu symptoms during peak outbreak periods, presumably due to the crossover protection against the variant strain. They also found decreased absenteeism and reduced use of health care resources, antibiotics, and over-the-counter medications.⁵
- Wang et al. evaluated the effectiveness of the LAIV and the trivalent inactivated influenza vaccine (TIV) in more than 1 million military service members between the ages of 17 and 49 in three consecutive influenza seasons, beginning with the 2004–2005 season. They found that immunization with TIV was associated with a significantly lower incidence of clinical visits for influenza and pneumonia during each of the three influenza seasons. They concluded that, in highly immunized adult populations, TIV may be more effective than LAIV in preventing influenza and pneumonia morbidity, while LAIV may be better suited for those with no prior influenza vaccination, such as military recruits.⁶
- Wilde et al. serologically identified influenza infection and collected self-reported symptoms of respiratory and febrile illness from more than 200 HCP during a three-year period. The researchers found the vaccine to be 88% effective in preventing influenza A and 89% effective in preventing influenza B; only 1.7% of those who received the vaccine developed influenza. Among those who were not vaccinated, 13.9% developed influenza.⁷
- Bridges et al. found that vaccinating healthy adults younger than age 65 against influenza reduced rates of influenza-like illness, absenteeism, and physician visits in years when the vaccine and circulating viruses were well matched.⁸
- Potter et al. studied the impact of vaccinating HCP on the mortality rate in 12 geriatric long term care facilities. HCP vaccination was associated with a 43% decrease of

influenza-like illness and a 44% lower mortality rate in this elderly population. Vaccination of patients did not have any significant effects on the mortality rate.⁹

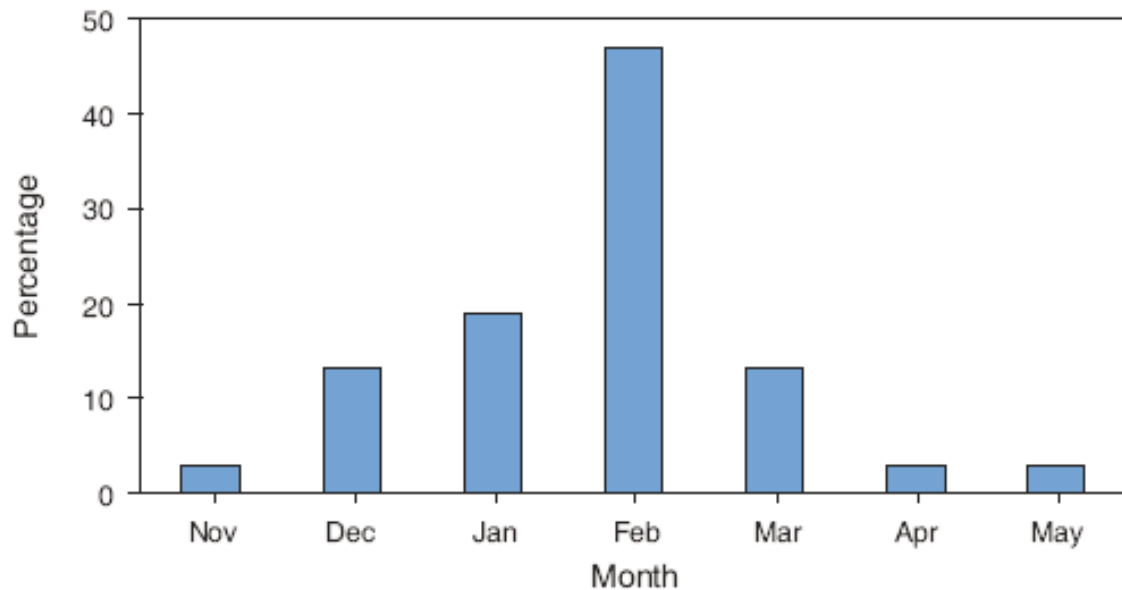
- Carman et al. found that influenza vaccination of long term care HCP was associated with a significant decrease in mortality among patients.¹⁰
- Hayward et al. studied the impact of influenza vaccinations among long term care HCP on influenza illness in residents of the facilities. They found that the vaccinations prevented influenza-related deaths and also reduced use of health services and influenza-like illness among residents.¹¹
- Salgado et al. found that an increase in the number of HCP receiving the influenza vaccination resulted in a significant drop in the number of laboratory-confirmed influenza cases among HCP and fewer cases of health care–associated influenza among hospitalized patients.¹²

Timing of Vaccination: When to Begin and How Long to Continue

The goal of HCP immunization programs is to administer the influenza vaccine to as many HCP as possible, preferably before influenza activity in the community begins. Precisely timing the beginning of an influenza season is difficult because influenza seasons vary in both onset and duration and because more than one outbreak can occur in a community in a given season.¹ Seasonal influenza activity in the United States has begun as early as October, but, more typically, it doesn't peak until January or later (and the peak often corresponds to the midpoint of influenza activity for the season).¹ In fact, in more than 80% of the influenza seasons since 1976, the peak has occurred no earlier than January; in more than 60%, the peak was February or later (see Figure 1-1, page 3).¹

According to the CDC, health care providers should begin offering vaccinations soon after the vaccine becomes available and, if possible, by October. But because the start and duration of the influenza season are so variable across communities, the CDC recommends continuing to offer the vaccine in December and throughout the influenza season, as long as vaccine supplies last.^{1,13}

Figure 1-1. Peak Influenza Activity, by Month—United States, 1976–1977 Through 2007–2008 Influenza Seasons



Source: Fiore A.E., et al.: *Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP)*, 2008. MMWR Recomm Rep 57:1–60, Aug. 8, 2008. <http://www.cdc.gov/mmwr/PDF/rr/rr5707.pdf> (accessed Nov. 19, 2008).

Adults develop peak antibody protection against influenza two weeks after receiving the vaccine.¹ The CDC recommends that persons or health care organizations planning immunization campaigns should consider scheduling them after mid-October, as the availability of vaccine in any given location cannot be guaranteed in the early fall.¹

Each year since 2006, the CDC has sponsored a “National Influenza Vaccination Week” (NIVW) to help raise awareness about the seriousness of influenza and the importance of annual influenza vaccination throughout the entire influenza season.¹⁴ The CDC has partnered with the United States Department of Health and Human Services, the National Influenza Vaccine Summit, and others in support of ongoing seasonal influenza immunization efforts. During NIVW these organizations sponsor podcasts, “Health-e-Cards,” and other electronic health-related activi-

ties.¹⁵ For example, the e-card system allows one to send a personalized message along with the CDC message to either individual HCP or to groups. The e-card system and other free promotional materials are available at <http://www.cdc.gov/flu/nivw/help.htm>.

The Vaccines: Similarities and Differences

Both the intranasal LAIV and the intramuscular TIV are directed at two specific influenza A viruses and one specific influenza B virus. Each year, one or more virus strains in the vaccine may be changed, based on global influenza virus surveillance.¹

Both TIV and LAIV are available in the United States, and both are effective in preventing influenza in vaccinated individuals. The major differences include the following:

- TIV contains killed viruses and therefore cannot cause influenza; LAIV contains live, attenuated viruses that can potentially cause mild signs or symptoms such as runny nose, fever, sore throat, and nasal congestion. This vaccine, however, cannot cause influenza infection in the lower respiratory tract.
- TIV is administered by injection intramuscularly; LAIV is administered by an intranasal spray.
- TIV is licensed for use by persons 6 months of age or older, including healthy individuals and those with chronic medical conditions; LAIV is licensed for use by healthy nonpregnant individuals between 2 and 49 years of age. The effectiveness of LAIV has not been established for those who have underlying medical conditions associated with a higher risk of complications from influenza.
- In a study by Belshe et al., LAIV was shown to be more protective in preventing culture-confirmed influenza than TIV in children 6 to 59 months of age and to be safe for use in children without a history of wheezing or asthma.¹⁶

Table 1-1 on page 5 compares the two types of vaccines.

Vaccine Supply Considerations

Table 1-2, page 6, lists the influenza vaccine manufacturers for the 2008–2009 influenza season.

Because the influenza viruses change over time as a result of antigenic drift, the vaccines must be updated annually to include the strains most likely to be in circulation in the upcoming season. Manufacturers of the vaccines are under a tight production time line to produce, test, release, and distribute the vaccines. Because problems encountered in any phase of vaccine production can result in shortages or delays in getting the vaccine to the public, the annual supply and timing of vaccine distribution cannot be guaranteed in any given year.¹ In fact, influenza vaccine shortages and delays in vaccine production have occurred in the United States during the 2000–2001, 2001–2002, and 2004–2005 seasons.¹⁷

In response to the 2004–2005 vaccine shortage, uncertainties about the number of doses that would be available, and the timing of vaccine distribution, the CDC issued recommendations for prioritizing available TIV in high-risk populations in 2004.¹⁸ In 2005 the CDC updated its recom-

mendations,^{17,19} identifying priority high-risk groups who should preferentially receive the vaccine in the initial weeks of the influenza season until the TIV supply is stabilized. Groups who should be given priority include HCP who provide direct patient care (For a list of the 2008 CDC recommendations about prioritizing the vaccination of individuals at high risk for medical complications, see Text Box 1-1 on page 7). LAIV is recommended only for use in healthy nonpregnant individuals ages 2 to 49, therefore the CDC recommends use of LAIV only for such persons when feasible and when TIV is in short supply,¹⁹ and it makes no recommendations about prioritization. More information about the dynamics of influenza vaccine supply and demand is available on the Prevent Influenza Now! Web site: http://www.preventinfluenza.org/profs_production.asp.

The CDC recommendations for allocating vaccine during vaccine shortages do not apply uniformly to all HCP.¹⁷ This issue was addressed by the Society for Healthcare Epidemiology of America (SHEA) in its 2005 position paper on influenza vaccination of HCP.²⁰ In this paper, Talbot et al. summarize the many factors that need to be considered by health care organizations when vaccine supply is limited. The authors considered the range of issues that may affect decisions about vaccine allocation when vaccine is in short supply, noting that any allocation strategy must be both practical and transparent to HCP. Key factors to take into consideration when making decisions about allocation strategies include the following²⁰:

- Prioritizing the vaccination of HCP by the nature, degree, and duration of their contact with patients. Those in close, prolonged, and repeated contact with patients are at greatest risk of exposure to and transmission of influenza. Providing the vaccine to these HCP could maximize the impact of a limited supply of vaccine.
- Providing vaccine to HCP who have the most intense and frequent contact with high-risk patients, such as the elderly or those with underlying medical conditions (CDC 2008¹). (See the CDC recommendations in Text Box 1-1 on page 7.)
- Considering which HCP provide essential services, without which the functioning of the health care facility would be jeopardized

Table 1-1. Live, Attenuated Influenza Vaccine (LAIV) Compared with Trivalent Inactivated Influenza Vaccine (TIV) for Seasonal Influenza, United States Formulations

Factor	LAIV	TIV
Route of administration	Intranasal spray	Intramuscular injection
Type of vaccine	Live-attenuated virus	Killed virus
Number of included virus strains	Three (two influenza A, one influenza B)	Three (two influenza A, one influenza B)
Vaccine virus strains updated	Annually	Annually
Frequency of administration	Annually*	Annually*
Approved age	Persons aged 2–49 yrs†	Persons aged ≥ 6 months
Interval between 2 doses recommended for children aged ≥ 6 months–8 years who are receiving influenza vaccine for the first time	4 weeks	4 weeks
Can be administered to persons with medical risk factors for influenza-related complications†	No	Yes
Can be administered to children with asthma or children aged 2–4 years with wheezing during the preceding year§	No	Yes
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 stem cell transplant recipient)	No	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

* Children aged 6 months–8 years who have never received influenza vaccine before should receive 2 doses. Those who only receive 1 dose in their first year of vaccination should receive 2 doses in the following year, spaced 4 weeks apart.

† Persons at high risk for complications of influenza infection because of underlying medical conditions should not receive LAIV. Persons at higher risk for complications of influenza infection because of underlying medical conditions include 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 immunosuppression; children and adolescents receiving long-term aspirin therapy (at risk for developing Reye syndrome after wild-type influenza infection); persons who have any condition (e.g., cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders) that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration; pregnant women; and residents of nursing homes and other chronic-care facilities that house persons with chronic medical conditions.

§ Clinicians and vaccination programs should screen for possible reactive airways diseases when considering use of LAIV for children aged 2–4 years, and should avoid use of this vaccine in children with asthma or a recent wheezing episode. Health-care providers should consult the medical record, when available, to identify children aged 2–4 years with asthma or recurrent wheezing that might indicate asthma. In addition, to identify children who might be at greater risk for asthma and possibly at increased risk for wheezing after receiving LAIV, parents or caregivers of children aged 2–4 years should be asked: "In the past 12 months, has a health-care provider ever told you that your child had wheezing or asthma?" Children whose parents or caregivers answer "yes" to this question and children who have asthma or who had a wheezing episode noted in the medical record during the preceding 12 months, should not receive FluMist.

¶ Live attenuated influenza vaccine coadministration has been evaluated systematically only among children aged 12–15 months who received measles, mumps and rubella vaccine or varicella vaccine.

** Inactivated influenza vaccine coadministration has been evaluated systematically only among adults who received pneumococcal polysaccharide or zoster vaccine.

Source: Fiore A.E., et al.: *Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008.* MMWR Recomm Rep 57:1–60, Aug. 8, 2008. <http://www.cdc.gov/mmwr/PDF/rr/rr5707.pdf> (accessed Nov. 19, 2008).

Table 1-2. Influenza Vaccines for the 2008–2009 Influenza Vaccination Season

Manufacturer	Product	Formulation	Age Indication
CSL Biotherapies	Afluria®	5.0 mL vial (10 doses)	18 years and older
		0.5 mL single-dose syringe	
GlaxoSmithKline (GSK)	Fluarix™	0.5 mL prefilled syringe (single dose)	18 years and older
GlaxoSmithKline (GSK)	FluLaval™	5.0 mL vial (10 doses)	18 years and older
MedImmune	FluMist™	0.2 mL prefilled single-use sprayer (10-dose pack)	2 through 49 years
Novartis Vaccines	FluVirin™	0.5 mL single-dose syringe	4 years and older
		5.0 mL vial (10 doses)	
sanofi pasteur	FluZone®	5.0 mL vial (10 doses)	6 months and older
		0.5 mL single-dose syringe	36 months and older
		0.5 mL single-dose vial	36 months and older
		0.25 mL single-dose syringe	6–35 months

Source: National Influenza Vaccine Summit: Information for Healthcare Professionals. http://www.preventinfluenza.org/profs_production.asp (accessed Apr. 22, 2009).

- Identifying HCP who work in high-patient-traffic areas, such as units with high occupancy and rapid patient turnover. HCP in these areas are likely to be at increased risk for exposure to patients not yet identified as being ill with influenza, which could result in subsequent HCP transmission to a larger number of patients.
- Identifying where influenza patients are initially seen before droplet precautions can be implemented. HCP working in emergency departments or walk-in clinics, or who are emergency first responders, could be in this category.
- Using LAIV instead of TIV in eligible HCP, such as healthy, nonpregnant HCP younger than age 49. Although this vaccine has been modified into a non-virulent strain that cannot cause influenza disease, Talbot et al. note that the CDC advises HCP who have received this vaccine to avoid contact with severely immunocompromised patients requiring care in a protective environment (for example, a bone marrow transplant unit) for seven days following its administration due to a theoretical risk of transmission of live vaccine virus.
- Using nonvaccine and nonpharmaceutical measures to prevent influenza among HCP, patients, and visitors (for example, proper hand hygiene, adherence to respiratory hygiene and cough etiquette, screening and exclusion of visitors who are ill, sick leave for HCP with febrile respiratory symptoms)
- Consider using antiviral therapies for HCP at risk for influenza

- Encouraging HCP who are not in an organization's priority group but who are in a high-risk group, as identified by the CDC, to receive the vaccine from their own health care provider or health department
- Using vaccination strategies that can be adapted to the unique needs and services of the health care facility. Bringing together a multidisciplinary advisory board, including leaders in key areas such as infectious diseases, infection prevention, occupational health, pharmacy, ethics, and so on, may help the organization identify its high-risk areas and populations and develop a vaccine allocation plan.

Based on these key considerations, the SHEA position paper proposed a tiered approach to the distribution of vaccine to HCP in the event of an inadequate vaccine supply²⁰:

- 1A: HCP who are in close, prolonged, and repeated contact with high-risk patients in high-risk units
- 1B: HCP who are in close but not prolonged or repeated contact with high-risk patients
- 1C: HCP who work in high patient-traffic units or who perform essential patient care functions
- 2: HCP who have contact with patients who are not at high risk
- 3: All other HCP

HCP in all tier 1 levels should be considered equal except during times of severe vaccine shortages.

The Influenza Vaccine Availability Tracking System (IVATS) was created by the National Influenza Vaccine Summit, which is cosponsored by the CDC and the American Medical Association. The IVATS system was developed to address difficulties that immunization program managers may experience when trying to determine which distributors or manufacturers have influenza vaccine in stock. IVATS links HCP seeking vaccine with wholesale distributors or manufacturers who have supplies of the vaccine in stock for sale or available to order. The information on IVATS is provided by the distributors or manufacturers on a voluntary basis and is updated throughout the influenza season. This system can be particularly helpful in times when supply is limited. It is also useful for health care organizations that want to continue vaccinating their HCP over the course of an entire influenza season and want to maintain access to available supplies of vaccine. IVATS provides a

Text Box 1-1. Persons at Risk for Medical Complications

Vaccination to prevent influenza is particularly important for those who are at increased risk for severe complications from influenza or who are at increased risk for influenza-associated clinic, emergency department, or hospital visits:

- All children 6 months to 4 years (59 months) of age
- All persons 50 and older
- Children and adolescents (6 months to 18 years of age) who are receiving long-term aspirin therapy and who might be at risk for experiencing Reye syndrome after influenza virus infection
- Women who will be pregnant during the influenza season
- Adults and children who have chronic disorders of the pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological, or metabolic (including diabetes mellitus) systems
- Adults and children who are immunosuppressed (including immunosuppression caused by medications, HIV, or other conditions)
- Adults and children who have any condition (such as cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders) that can compromise respiratory function, impede the clearing of respiratory secretions, or increase the risk for aspiration
- Residents of long term care and other chronic-care facilities

Source: Fiore A.E., et al.: Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2008. MMWR Recomm Rep 57:1–60, Aug. 8, 2008. <http://www.cdc.gov/mmwr/PDF/rr/rr5707.pdf> (accessed Nov. 19, 2008).

downloadable Microsoft Excel spreadsheet that contains the following information²¹:

- The names of wholesale distributors or manufacturers that have supplies of the vaccine in stock for sale and to order
- Brands and formulations in stock for sale and to order
- How to order vaccine by telephone, e-mail, the Internet, or fax
- Projected dates of availability for vaccine being ordered

For more information about IVATS, go to <http://www.preventinfluenza.org/ivats/>.

Summary

This chapter examines vaccine effectiveness and factors that contribute to it, including vaccine availability, type, and supply; the timing of vaccination; and anticipation and management of shortages of vaccine, particularly when planning for the immunization of HCP. It also offers recommendations for the identification of HCP and patients most at risk for transmission of influenza. Chapter 2 explores immunization rates among HCP and considers research findings about practices designed to improve these rates.

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CHAPTER

2

Issues Surrounding the Immunization of Health Care Personnel Against Influenza

Influenza immunization rates among health care personnel (HCP) vary by occupational group and demographics. In general, researchers have found that physicians are more likely to accept the vaccination than nurses¹ or nonmedical HCP.² Older HCP are vaccinated more often than those younger than age 50,³ and HCP with some college education are more likely to receive the vaccination than those with only a high school education or less.⁴ An understanding of the immunization patterns and demographics of HCP can guide the development of strategies to improve influenza immunization rates.⁵ This chapter explores patterns, demographics, and individual factors influencing HCP decisions regarding vaccination. It also reviews the research surrounding the question, “Should influenza immunization be mandatory?”

Immunization Rates Among Health Care Personnel

King et al. analyzed data from the National Center for Health Statistics 2000 National Health Interview Survey (NHIS), an annual face-to-face survey of the U.S.

population, to determine the nature of the variance in vaccination rates. The researchers, who studied a representative sample of 1,651 HCP who worked in both hospital and nonhospital settings, note that the overall influenza vaccination rate among their sample at the time of the survey was 35.8%.⁶ Unlike the researchers whose findings are mentioned above, King et al. found no correlation between vaccination rates and educational level; but, like the others, they did find significantly lower vaccination rates among HCP younger than age 50. They also found that health care aides, who have a substantial amount of close contact with patients, have the lowest influenza vaccination rates among health care workers. They found that the group with the highest vaccination rates are those who diagnose illness, including physicians, followed by health technicians and those responsible for health assessment, including nurses.⁶ Walker et al. conducted a similar review using the 2002 NHIS data and found the overall influenza rate among HCP to be 38.4%; they also found vaccination rates to be lower among HCP who were younger than age 50. In addition, they found that hospital employees were more likely to be vaccinated than non-hospital employees.⁴

Other researchers have also studied variations in HCP influenza vaccination rates and found the following:

- Christini et al. conducted surveys with more than 1,000 HCP at two Pennsylvania tertiary care teaching hospitals in an urban center. Their overall influenza vaccination rate was 52%. They found that physicians and medical students were significantly more likely to have received the influenza vaccine than all other groups combined, with vaccination rates of 69% and 63%, respectively ($p < .0001$). They found that the vaccination rate of nurses was 46%; aides, 42%; and those who worked in administration, 29%. Among physician groups, they found that pediatricians were significantly more likely to be vaccinated (84%) than internists (69%) or surgeons (43%) ($p < .0001$).⁷
- Abrahamson and Levi analyzed survey results from 275 HCP (physicians, nurses, pharmacists, administrative and ancillary staff) at 27 primary care community clinics in the Jerusalem area at the conclusion of the 2007 influenza season. The overall influenza vaccination rate was approximately 30%, with physicians reporting a significantly higher rate of immunization than nonphysicians (40.4% compared with 24.9%, $p = .008$). The researchers also saw significant associations between immunization and HCP age, as well as immunization and gender: Of those between ages 54 and 65, 50.6% were immunized, compared with 20.7% of those between ages 24 and 53, $p < .001$; 41% of males were immunized, compared with 27.1% of females, $p = .037$.³
- A study by Martinello et al. assessed immunization among physicians (attending physicians, house staff, and medical students) and nurses (patient care associates, licensed practical nurses, and registered nurses) in a large urban teaching hospital in Connecticut. Like the others, these researchers found higher rates of immunization among physicians than nurses (82% versus 62%, $p = .0009$).¹
- Maltezou et al. conducted a nationwide survey of HCP in 132 public hospitals in Greece to learn the reasons for their acceptance or nonacceptance of the influenza vaccine during the 2006–2007 influenza season. Among respondents, the mean influenza immunization rate was 5.8%.

Like other researchers, they found a correlation between older age and higher immunization rates; but unlike several others, they found that nurses had higher immunization rates than physicians (47.6% versus 24.7%).⁸

- In an earlier nationwide survey, Maltezou et al. studied immunization rates among physicians according to the type of hospital in which they worked. They found lower rates among physicians working in the following types of hospitals⁹:
 - Psychiatric hospitals, with a physician immunization rate of 9.7%, compared with a rate of 16.6% among physicians in general hospitals
 - Hospitals with 201–400 beds, or those with more than 400 beds, with physician immunization rates of 14.2% and 15.2%, respectively, compared with an immunization rate of 22.7% among physicians in hospitals with 1–200 beds
- Lester et al. surveyed all residents, interns, and fellows in postgraduate training at 10 Toronto teaching hospitals during the 1999–2000 influenza season to determine vaccination rates as well as factors influencing vaccination decisions and vaccine effectiveness. Overall, 51.3% of the 670 survey respondents selected for analysis received the vaccine during the study period. Vaccination rates were similar between males and females, and researchers observed no significant differences among age groups. Immunization rates were higher for those working in the fields of community and occupational medicine (76.9%) and pediatrics (75%) and lower for those working in psychiatry (31.9%), surgery (36.3%), and radiology (36.3%).¹⁰
- In a hospital in Geneva, Switzerland, Harbarth et al. surveyed HCP from three departments whose patients are at high risk—geriatrics, obstetrics, and pediatrics—to learn why they declined the influenza vaccination. These researchers found the immunization rate to be highest among physicians and lowest among nurses.¹¹

Factors Influencing HCP Vaccination

The medical literature provides a wide variety of reasons that HCP accept or decline influenza vaccinations. Among them are the following:

- Reasons HCP accept the influenza vaccination:
 - Desire for self-protection^{8,10,12,13}
 - Desire to protect patients^{7,8,12,14,15}
 - Desire to protect family members^{8,15}
 - Previous receipt of influenza vaccine^{15–18}
 - Perceived effectiveness of the vaccine^{10,19}
 - Desire to avoid missing work^{12,15,20}
 - Peer recommendation¹²
 - Personal physician recommendation¹⁵
 - Strong worksite recommendation²¹
 - Had influenza previously²⁰
 - Belief that receiving the vaccine is a professional responsibility²¹
 - Access to the vaccination/convenience^{20,21}
 - Vaccinations provided free of charge^{20,21}
 - Belief that benefit of the vaccination outweighs the risk of side effects²¹

- Reasons HCP decline the influenza vaccination:
 - Fear of getting influenza/influenza-like illness^{3,7,14,18,20,22}
 - Fear of vaccine side effects^{8,10,12,13,17,18,21–24}
 - Perceived ineffectiveness of the vaccine^{8,10,11,13,16–18,21,23,24}
 - Perceived low or no likelihood of developing influenza^{8,11,14,16,20–22,24,25}
 - Fear of needles^{16,20,22,23}
 - Insufficient time, inconvenience, or forgetting to get the vaccination^{3,7,10,13,17,21}
 - Reliance on homeopathic medications^{11,24}
 - Belief that their own host defenses would prevent influenza^{11,25}
 - Belief that other preventive measures would minimize or eliminate influenza risk^{19,25}
 - Lack of physician recommendation³
 - Belief that influenza is not a severe disease¹²
 - Lack of free vaccinations^{3,12}
 - Younger age^{17,26}

Other factors that can influence HCP acceptance of influenza vaccinations include thimerosal in vaccines and culture:

- Public concern about exposure to thimerosal, a mercury-containing antibacterial compound used as a preservative in some vaccines, may pose a barrier to vaccination, according to the Centers for Disease Control and Prevention (CDC).²⁷ Although there is no scientific evidence that thimerosal in influenza vaccine—or in any

other vaccine—poses health risks beyond occasional local hypersensitivity, the U.S. Public Health Service and other federal agencies and professional medical organizations have recommended eliminating or reducing thimerosal from vaccines as one way of reducing the public’s exposure to mercury. Some states have passed legislation banning the use of vaccines containing mercury. The intranasal live, attenuated influenza vaccine (LAIV) and many of the single-dose injectable preparations of the trivalent inactivated influenza vaccine (TIV) are thimerosal free. The availability of thimerosal-free influenza vaccines is expected to increase.²⁷

- Cultural considerations play an important role in HCP decisions to accept or decline vaccination. In their efforts to find out why HCP declined the influenza vaccination, Harbarth et al. note significant differences between the reasons they identified in their hospital in Geneva, Switzerland, and those cited in the North American studies they reviewed. While the most often-cited reasons for declining the vaccination in North American studies were avoiding medications whenever possible and fear of adverse reactions, these concerns were cited by only a minority of HCP in Geneva. The reason HCP in Geneva most often gave for declining the vaccination was confidence in their host defenses against influenza.¹¹ It is important to recognize such differences when planning immunization strategies. Reliance on strategies that may work to influence HCP attitudes, beliefs, or perceptions in one cultural setting may “miss the mark” and not address HCP concerns in another.

Appendix 2-1 on pages 20–23 describes several articles about surveys that researchers have used to find out why HCP have accepted or declined influenza vaccinations.

Impact of Institutional Outbreaks

HCP can acquire influenza from the community or their patients and can transmit it to patients or other HCP. Influenza transmission and outbreaks in health care organizations have been recognized for many years and have been associated with substantial morbidity, mortality, and costs.^{28–30} Influenza’s short incubation period and ease of transmission through respiratory droplets from person to person can result in explosive outbreaks of febrile respiratory illness; health care settings are favorable environments for such transmission.^{31,32} In their review of 28 articles on

hospital influenza outbreaks, Voirin et al. note that such outbreaks are probably underdetected and underreported due to a lack of standardization in surveillance methodologies and definitions of influenza, alerts based on nonspecific symptoms, and symptoms masked by treatment (for example, the absence of fever in a patient receiving antipyretics); taken together, it is not surprising that identifying, tracking, and describing outbreaks is difficult.³³ See Appendix 2-2 on pages 24–27 for a summary of influenza outbreaks that have occurred in various health care settings.

A summary description of some of the issues surrounding the impact of institutional outbreaks of influenza follows:

■ Patient Morbidity and Mortality

Influenza is the sixth leading cause of death in adults in the United States.³⁴ Each year, influenza causes substantial morbidity and mortality, particularly in high-risk populations such as the very young and the elderly, and among those with high-risk illnesses or conditions such as chronic pulmonary or cardiovascular disorders or immunosuppression due to disease or medications.²⁷ Deaths associated with influenza are often due to pneumonia or complications associated with underlying cardiopulmonary conditions, and as many as 90% of all influenza-related deaths occur among the elderly.³¹ Van den Dool et al. note that influenza outbreaks have been associated with attack rates as high as 60%, with half of those infected developing pneumonia and one-tenth of these patients dying from the disease.³⁵ Increased rates of HCP vaccination result in decreased rates of health care–associated influenza.^{29,36} In fact, Hayward et al. conclude that the reduction in morbidity, mortality, and use of health service resources associated with vaccinating their long term care HCP is “equivalent to preventing five deaths, two admissions to hospitals with influenza-like illness, seven general practitioner consultations for influenza-like illness, and nine cases of influenza-like illness per 100 residents during the period of influenza activity.”³⁶

■ Staff Shortages

At the current national influenza vaccination rate among HCP of 42%,²⁷ many HCP remain vulnerable to becoming ill with the disease. In a review of the literature by Keech and Beardsworth, self-reported estimates of working days lost by healthy adults ranged from < 1 day to

4.3 days per influenza illness episode.³⁷ Influenza among HCP can result in staffing shortages, especially during the peak of influenza season and at a time when many hospitals are strained by the volume of patient admissions due to influenza and its complications.³⁸ In years when there is a good match between the vaccine and circulating influenza viruses, immunization reduces illness and work absenteeism.^{39,40}

■ Increased Costs

Health care–associated influenza illness increases health care costs. Patients who develop influenza can have additional charges for diagnostic procedures, treatments, supplies, and extra hospital days. HCP who take sick leave cause the organization to incur costs associated with finding replacement staff in addition to the costs associated with any medical care. Delayed or curtailed admissions during influenza outbreaks reduces revenue to health care organizations.^{38,41} Keech and Beardsworth also note that productivity can suffer, as staff function at a reduced capacity when they return to work.³⁷ Costs and the loss of revenue associated with patient or family dissatisfaction caused by awareness of an organization’s influenza incidence or outbreak may be more difficult to quantify.⁴¹

■ Cost Savings of Effective Programs

The cost savings associated with HCP influenza vaccination programs generally outweigh the costs associated with providing the vaccine, and vaccinating ultimately results in a safer environment for patients.³⁸ Research done in 1994 by Nichol et al. found 25% fewer upper respiratory infections, 43% fewer sick days taken, and 44% fewer visits to physicians for upper respiratory infections in healthy adults who received the vaccine than in the placebo group, with an estimated cost savings of \$46.85 per person vaccinated.⁴² Other researchers have estimated that 11 HCP absentee days were averted for every 100 HCP who received the vaccine.⁴⁰ Burls et al. performed systematic reviews of the literature for vaccine effectiveness, cost-effectiveness, and economic impact and determined that vaccination of HCP against influenza not only protects HCP but also provides indirect protection to high-risk populations. They also concluded that vaccination of HCP is cost-effective and is probably cost saving.⁴³ Although Thomas et al. found no high-quality evidence that HCP influenza vaccinations reduce the incidence of influenza in elderly populations,

the researchers recognized that, due to the serious nature of the disease in elderly and compromised groups and the low risks associated with HCP vaccinations, increasing vaccine coverage is important, as is assessing the effects of vaccination in well-designed studies.⁴⁴

Issues Surrounding Mandatory Influenza Immunization Programs

Despite national and international recommendations for vaccinating HCP, voluntary efforts to do so have historically been poor, having leveled off at about 42% in the United States.²⁷ Talbot comments that, because education does not appear to be a continuing driving factor in increasing HCP influenza vaccination acceptance rates, requiring vaccination to some degree appears to be the next logical step.⁴⁵ He further states, “Low rates of influenza vaccinations among [health care workers] should be akin to poor hand hygiene adherence and substandard infection control practices—unacceptable to all.”^{45(p. 109)} The low rates of voluntary vaccination have led, inevitably, to discussions about whether HCP should be required to receive the influenza vaccine each year, and the moral, ethical, and legal implications of such a requirement. The following authors have examined the issue of mandatory influenza vaccination programs for HCP from these perspectives:

- Anikeeva et al. considered the ethical implications of various efforts to increase vaccination rates, including mandating vaccinations. The ethical principles of nonmaleficence (first do no harm) and beneficence (act in the best interest of patients) considered within the context of requiring HCP to receive influenza vaccinations are strong arguments in favor of such a requirement. However, the rights of HCP to make their own health care choices and have their autonomy respected are also ethical considerations. These researchers also cite other negative aspects of compulsory influenza vaccination programs, including the following⁴⁶:
 - The coercive and invasive nature of such programs, especially if linked to sanctions such as job loss
 - The liability suits that could arise in cases of serious side effects of the vaccine, with a history of successful court challenges to mandatory influenza vaccination programs

- The potential damage to workplace relationships, alienating HCP and undermining trust
- The inability of HCP to accept the vaccination for various reasons, including medical contraindications

For these reasons, these authors conclude that a non-compulsory program is ethically preferable to a required or mandated one. They suggest positive incentives for vaccination such as prizes, recognition or rewards for units or departments, or financial rewards to avoid the ethical pitfalls of coercion. Furthermore, education and minor sanctions (such as requiring HCP to actively decline the vaccination, suspension of minor privileges, restrictions on areas in which nonvaccinated HCP could work) can be justified from an ethical perspective. Voluntary programs should also ensure that barriers to receiving the vaccine are minimized.

- Finch argues against the implementation of mandatory influenza vaccinations of HCP for the following seven reasons⁴⁷:
 1. Truly mandatory programs would allow only medical or religious reasons for nonacceptance of the vaccination, resulting in job loss for HCP who decline for other reasons. This would have a detrimental effect on the relationship between those carrying out the mandate and HCP. In contrast, voluntary programs, which focus on the common purpose of protecting patients and mutual respect among all involved, strengthen relationships.
 2. There would likely be legal challenges to such programs, which might be viewed as invading civil liberties.
 3. Liability issues would be raised if HCP were to experience a rare but serious side effect of the vaccine, such as Guillain-Barre syndrome or anaphylaxis.
 4. Voluntary hepatitis B vaccination programs, which can serve as models for noncompulsory influenza vaccination programs, have reached an acceptance rate of 75% among HCP, accomplished through targeted education, free vaccine, and active declinations.

5. Compulsory vaccination programs may minimize the focus on other infection prevention measures, such as hand hygiene and prompt patient isolation, and thereby create a false sense of security.
 6. If public reporting of HCP vaccination rates were required to protect patient safety, this could strengthen voluntary vaccination programs, obviating the need for mandatory programs.
 7. The use of active declinations conveys strong institutional support of influenza vaccinations of HCP and, along with other voluntary measures, has been useful in helping to achieve higher vaccination rates.
- Backer, in a counterpoint to Finch, proposes the following reasons in favor of mandatory influenza vaccination⁴⁸:
- Immunity to vaccine-preventable diseases is a critical component of disease prevention and infection control programs.
 - Low vaccination rates in voluntary vaccination programs persist despite the CDC and the Advisory Committee on Immunization Practices recommendations, in place since 1984, that HCP receive this vaccine.
 - Health care personnel are at greater risk for becoming ill with influenza than are members of the general public due to their more frequent exposure to individuals with the disease.
 - Health care personnel shed the virus for at least 1 day before the onset of symptoms; many shed the virus for 5–10 days, although they have few or no symptoms; and many HCP work even when they are ill.
 - The obligation to protect patients from harm and to act in their best interests serves as a moral imperative to give HCP the influenza vaccine.
 - An awareness of the vaccine's benefits and not requiring HCP to receive it promotes liability concerns.
- The vaccine is safe, with systemic effects no more common than with placebos.
 - Influenza vaccination programs are the most cost-effective of all adult preventive health programs, reducing HCP respiratory illnesses and absenteeism while protecting patients and reducing the risk of health care–associated influenza outbreaks.
 - Mandatory vaccination programs do work, as evidenced by the requirements in most states that children in schools and day care settings receive certain vaccinations. In addition, many health care organizations require HCP to show evidence of immunity to rubella and measles.
 - Both the National Foundation for Infectious Diseases (since 2004) and the Society for Healthcare Epidemiology of America (since 2005) have encouraged organizations to strengthen their HCP influenza vaccination efforts.
 - Unless organizations improve HCP vaccination rates, legislation is likely to mandate it.
 - When applied fairly and used judiciously, a mandated vaccination program is an appropriate public health practice.
- Poland et al. assert that influenza among HCP is a significant threat to patient safety, and the most efficient method for preventing morbidity and mortality among patients is HCP immunization. Mandatory influenza immunization programs are needed because voluntary programs over the past 25 years have failed to raise rates much above 40%. Requiring the vaccination of all HCP who have direct patient contact (unless there are medical contraindications or religious objections, or the individual signs an informed declination) would mirror the highly successful hepatitis B vaccination requirements for HCP. The authors suggest that, if the concern were an “exotic” virus with the same morbidity and transmissibility as influenza, public, legislative, and medical views of this health threat would be different. They postulate the following “seven truths” surrounding mandatory vaccination of HCP³⁸:

1. Influenza causes significant morbidity and mortality.
 2. HCP infected with influenza can spread it to their vulnerable patients.
 3. HCP influenza vaccination is cost-effective and prevents disruption in the workplace.
 4. The CDC already recommends influenza vaccination for HCP.
 5. Vaccination rates increase when vaccination is required.
 6. Health care organizations and HCP have the ethical and moral duty to protect patients from communicable diseases.
 7. Either the health care system will lead the way in this effort, or the duty will fall to legislative policymakers or enforcement organizations.
- Helms and Polgreen also support mandatory influenza vaccinations for HCP, citing the following reasons⁴⁹:
 - There is evidence that vaccinating HCP reduces mortality among patients in long term care facilities; in hospitals, HCP vaccinations reduce the transmission of influenza to patients.
 - The vaccination reduces HCP absenteeism and is cost-effective.
 - Voluntary vaccination programs have not been successful in achieving rates much above 40%.
 - The risk of harm to patients who develop influenza as a result of their exposure to influenza-infected HCP far outweighs the risk of harm to HCP from the vaccine.
 - In their counter to Helms and Polgreen, Isaacs and Leask argue against mandatory HCP influenza vaccinations for the following reasons⁵⁰:
 - The evidence is weak that HCP vaccinations protect patient populations, other than immunocompromised patients or patients in long term care facilities.
 - Vaccinating HCP could infringe on autonomy and civil liberty.
 - Mandatory vaccination programs could damage morale and alienate staff.
 - Voluntary, multifaceted programs should be promoted to encourage HCP participation.
 - Mah says the debate over mandatory influenza vaccinations for HCP requires clarifying the underlying disputes in the language of policy debate. Stakeholders on both sides of the issue may define the same policy goals or interpret the evidence differently. Those opposed to mandatory programs cite the risk of adverse events and stress the coercive nature of such programs and the value of using nonvaccine infection control measures. Mah says that those in favor of mandatory vaccination stress the risk of influenza transmission associated with sub-clinical infections, duty of care, and reduced HCP absenteeism.⁵¹

Summary

This chapter summarizes the multiple demographic characteristics and individual factors associated with HCP decisions to accept or decline influenza vaccination. It also explores the impact of institutional outbreaks of influenza, as well as issues and recommendations surrounding both voluntary and mandatory vaccination. Chapter 3 builds on this information, focusing on strategies that health care organizations can use to improve vaccination rates among their HCP.

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Appendix 2-1.

Examples of Research Articles Using Surveys to Identify Factors Influencing Vaccination of Health Care Personnel (HCP) Against Influenza

Reference	Setting(s) or Population(s)	Reasons for Accepting or Rejecting Influenza Vaccine
Abramson Z.H., Levi O.: Influenza vaccination among primary healthcare workers. <i>Vaccine</i> 26:2482–2489, May 12, 2008.	Primary care community clinics	Reasons given for not taking the vaccination included lack of time, forgetting it was being offered, or unavailable vaccine (18.4%), the misconception that the vaccine can cause influenza (15.1%), and lack of physician recommendation (37%).
Apisarntharak A., et al.: Impact of knowledge and positive attitudes about avian influenza (H5N1 virus infection) on infection control and influenza vaccination practices of Thai healthcare workers. <i>Infect Control Hosp Epidemiol</i> 29:472–474, May 2008.	Hospital (two tertiary care centers)	The main reasons given for receiving vaccination were self-protection (84%), protection of patients (56%), the desire to avoid missing work (25%), the belief that it was better to be vaccinated than to contract influenza (21%), and recommendation of their peers (15%). The increased acceptance of influenza vaccination by HCP was associated with the threat of an impending avian influenza epidemic. Among the HCP who reported not being vaccinated, the main reasons given were the unavailability of free vaccine, fear of side effects, and the belief that influenza is not a severe disease.
Bryant K.A., et al.: Improving influenza immunization rates among healthcare workers caring for high-risk pediatric patients. <i>Infect Control Hosp Epidemiol</i> 25:912–917, Nov. 2004.	Pediatric hospital (neonatal and pediatric intensive care units, oncology unit)	Protecting patients was the most common reason given for receiving the vaccine, followed by having received the vaccine previously, having the vaccine recommended by a personal physician, protecting their family members, avoiding influenza illness, and avoiding missing work. Oncology unit HCP cited the desire to protect their patients more often than intensive care unit HCP. The reasons for refusing vaccination varied by type of unit.
Chan-Tompkins N.H., et al.: Employee thoughts on influenza vaccine: Here we go again. <i>Infect Control Hosp Epidemiol</i> 29:186–187, Feb. 2008.	Hospital	The most common reasons for declining the vaccine were concern that it would give them influenza-like symptoms (26.4%), not believing in vaccines (20%), dislike of injections (12.5%), and believing they were not at risk for contracting influenza (9.1%). Reasons for declining varied according to whether the HCP was involved in direct patient care.
Christini A.B., Shutt K.A., Byers K.E.: Influenza vaccination rates and motivators among healthcare worker groups. <i>Infect Control Hosp Epidemiol</i> 28:171-177, Feb. 2007.	Hospital (2 tertiary care teaching hospitals)	Belief that the vaccine could cause illness and inconvenience were frequently cited as reasons for not receiving the vaccine, while understanding the potential for transmitting influenza from asymptomatic HCP was associated with accepting the vaccine. This group of researchers also found different reasons among groups of HCP and physician subspecialties for receiving the vaccine.

Appendix 2-1. Continued

Examples of Research Articles Using Surveys to Identify Factors Influencing Vaccination of Health Care Personnel (HCP) Against Influenza

Reference	Setting(s) or Population(s)	Reasons for Accepting or Rejecting Influenza Vaccine
Cowan A.E., et al.: Influenza vaccination status and influenza-related perspectives and practices among US physicians. <i>Am J Infect Control</i> 34:164–169, May 2006.	Physicians (family physicians, internists, geriatricians, and pulmonologists)	Reasons given for being vaccinated included believing that HCP have a professional responsibility to be vaccinated, having access to vaccination on site and free of charge, being aware of strong work-site recommendation for HCP vaccinations, and believing that the benefits of vaccination outweigh the risk of side effects. Reasons given for not being vaccinated were being “too busy/forgot” and being concerned about adverse reactions. Other reasons cited were believing that the chance of contracting influenza was small or that the effectiveness of the vaccine was insufficient.
Harbarth S., et al.: Influenza immunization: Improving compliance of healthcare workers. <i>Infect Control Hosp Epidemiol</i> 19:337–342, May 1998.	Hospital (geriatric, obstetric, and pediatric units)	The most frequent reasons HCP gave for not receiving the vaccine were believing that their own host defense mechanisms would protect them from influenza (32%), perceiving a low risk of getting influenza (23%), believing the vaccine does not work (19%), and never getting influenza (16%).
Kimura A.C., et al.: The effectiveness of vaccine day and educational interventions on influenza vaccine coverage among health care workers at long-term care facilities. <i>Am J Public Health</i> 97:684–690, Apr. 2007.	Long term care facilities	Factors associated with not being vaccinated during the 2001–2002 influenza season included younger age, perception that the vaccine was risky or ineffective, and the unavailability of free vaccine. Other reasons included forgetting to get vaccinated and being too busy. Receiving the influenza vaccination during the previous season was an important factor in receiving it during the next influenza season.
Maltezou H.C., et al.: Influenza vaccination acceptance among health-care workers: A nationwide survey. <i>Vaccine</i> 26:1408–1410, Mar. 10, 2008.	Public hospitals	This survey in 32 Greek hospitals found that the majority of vaccinated HCP (89.1%) did so in order to protect themselves; 59.1% were vaccinated to protect their families and 55.2% to protect their patients. Physicians and nurses were more frequently vaccinated to protect their patients compared with those in other professions. The main reasons for refusal to be vaccinated were the perception of not being at risk for contracting influenza and fear of the vaccine’s adverse effects. Other reasons for refusal included the belief that the vaccine is ineffective, absence during and being uninformed about the vaccination program, and being unaware that HCP are a target group for influenza vaccination. Significant differences in the levels of vaccine acceptance were found among professions, which are attributable to differences in levels of knowledge about or motivation for vaccination.

Continued

Appendix 2-1. Continued

Examples of Research Articles Using Surveys to Identify Factors Influencing Vaccination of Health Care Personnel (HCP) Against Influenza

Reference	Setting(s) or Population(s)	Reasons for Accepting or Rejecting Influenza Vaccine
Manuel D.G., et al.: Health behavior associated with influenza vaccination among healthcare workers in long-term-care facilities. <i>Infect Control Hosp Epidemiol</i> 23:609–614, Oct. 2002.	Long term care facilities	Vaccinated HCP had a more positive attitude toward influenza vaccination and a greater belief that the vaccine is effective. Nonvaccinated HCP were more likely to believe that other preventive measures are more effective than vaccination. HCP who participated in focus groups said they believe that the main purpose of influenza vaccination programs is to protect residents' health at the expense and potential harm of staff, while placing a burden of responsibility on staff.
Mehta M., Pastor C.A., Shah B.: Achieving optimal influenza vaccination rates: A survey-based study of healthcare workers in an urban hospital. <i>J Hosp Infect</i> 70:76–79, Sep. 2008.	Hospital (teaching)	The top two reasons for not receiving the vaccine were “I do not feel I need the vaccine” and “I am afraid of getting sick from the vaccine.” The respondents who believed they could protect their patients by accepting the influenza vaccine were more likely to be immunized.
Ofstead C.L., et al.: Influenza vaccination among registered nurses: Information receipt, knowledge, and decision-making at an institution with a multifaceted educational program. <i>Infect Control Hosp Epidemiol</i> 29:99–106, Feb. 2008.	Hospital (large tertiary medical center)	The majority of registered nurses who responded to a survey (86.7%) cited receiving the influenza vaccine in the past as the reason they would be vaccinated during the coming influenza season. Reasons most frequently reported for declining vaccination were doubts about the risk of influenza and the need for vaccination, concerns about vaccine effectiveness and side effects, and dislike of injections.
Piccirillo B., Gaeta T.: Survey on use of and attitudes toward influenza vaccination among emergency department staff in a New York metropolitan hospital. <i>Infect Control Hosp Epidemiol</i> 27:618–622, Jun. 2006.	Hospital (emergency department of teaching hospital)	The main reason respondents gave for receiving the vaccine was having had influenza previously. Misconceptions about the efficacy of the vaccine, concerns about side effects, and the fear of contracting influenza were given as reasons for declining the vaccine.
Steiner M.A., et al.: Factors influencing decisions regarding influenza vaccination and treatment: A survey of healthcare workers. <i>Infect Control Hosp Epidemiol</i> 23:625–627, Oct. 2002.	Hospital	The most common reasons for accepting the vaccine were to avoid missing work, convenience, and having it provided at no cost to HCP. More than half had had influenza previously and wanted to prevent it. The most common reasons for rejecting the vaccine were concerns that it would cause illness, a dislike of needles or painful injections, and a perception of low risk of contracting influenza. One-third of vaccine recipients indicated that they would refuse vaccination if asked to pay for it out-of-pocket.

Appendix 2-1. Continued

Examples of Research Articles Using Surveys to Identify Factors Influencing Vaccination of Health Care Personnel (HCP) Against Influenza

Reference	Setting(s) or Population(s)	Reasons for Accepting or Rejecting Influenza Vaccine
<p>Willis B.C., Wortley P.: Nurses' attitudes and beliefs about influenza and the influenza vaccine: A summary of focus groups in Alabama and Michigan. <i>Am J Infect Control</i> 35:20–24, Feb. 2007.</p>	<p>Focus groups of registered nurses in two cities</p>	<p>Many nurses voiced concerns about influenza vaccine ineffectiveness and safety as reasons for rejecting vaccination. Unvaccinated nurses did not think they were at risk for influenza, believing that they did not fall into high-risk groups and that they had stronger immune systems due to workplace exposure to diseases. They believed the vaccine was not important and that using routine preventive measures, such as hand hygiene and Standard Precautions, minimized their risk.</p> <p>Nurses who seemed to be more knowledgeable about influenza and risk factors for the disease accepted the vaccination more often than less-knowledgeable nurses.</p>
<p>Wodi A.P., et al.: Influenza vaccine: Immunization rates, knowledge, and attitudes of resident physicians in an urban teaching hospital. <i>Infect Control Hosp Epidemiol</i> 26:867–873, Nov. 2005.</p>	<p>Resident physicians at a university</p>	<p>Most of the residents (93.3%) who had received the influenza vaccine cited self-protection as one of the reasons for doing so; but only 33.3% cited self-protection as the most important reason for being vaccinated. Only 2.7% cited protecting patients as the most important reason.</p> <p>Lack of time was the reason most often given for nonacceptance of the vaccine (47.1%), followed by doubts about its effectiveness (24%) and concerns about side effects (20.7%).</p>

Appendix 2-2. Examples of Articles About Health Care–Associated Influenza Outbreaks

Reference	Setting/Outbreak Population	Duration of Outbreak	Brief Summary of Outbreak
Sartor C., et al.: Disruption of services in an internal medicine unit due to a nosocomial influenza outbreak. <i>Infect Control Hosp Epidemiol</i> 23:615–619, Oct. 2002.	Hospital medical unit	1 week in patients	This 19-bed medical unit had 23 patients during the outbreak period, which included the index case admitted with influenza. Nine of the 22 hospitalized patients (41%) developed influenza-like illness. Five of the 22 health care personnel (HCP) (23%) on the unit also developed illness. Vaccinated patients and HCP were significantly less likely to develop influenza than those who were not vaccinated. The first two HCP who developed influenza-like illness or confirmed influenza worked with patients while ill themselves and may have transmitted the infection to their patients. The outbreak resulted in postponement of 8 scheduled admissions and all emergency admissions for 11 days. Hospital charges attributable to the outbreak were also figured.
Malavaud S., et al.: Nosocomial outbreak of influenza virus A (H3N2) infection in a solid organ transplant department. <i>Transplantation</i> 72:535–537, Aug. 15, 2001.	Solid organ transplant unit	4 days	A 12-bed transplant unit with all single rooms experienced 4 cases of health care–associated influenza A during a 4-day outbreak. None of the patients had received influenza vaccination. Three of the 27 HCP who had been working in the department at the time of the outbreak were diagnosed with influenza during the same period, with 1 nurse reporting headache and fever two days before the onset of the first case. None of the 3 HCP had received the influenza vaccination. Although the precise origin of infection could not be determined, there was a temporal association between ill HCP and subsequent infection in the 4 patients.

Appendix 2-2. Continued

Examples of Articles About Health Care–Associated Influenza Outbreaks

Reference	Setting/Outbreak Population	Duration of Outbreak	Brief Summary of Outbreak
<p>Cunney R.J., et al.: An outbreak of influenza A in a neonatal intensive care unit. <i>Infect Control Hosp Epidemiol</i> 21:449–454, Jul. 2000.</p>	<p>Neonatal intensive care unit</p>	<p>18 days in the infants</p>	<p>This 34-bed unit had a census of 38 infants on the first day of the outbreak; of 54 infants in the unit over the 18-day period, 19 (35%) were positive for influenza A, with 6 being asymptomatic. One infant died. Only 15% of HCP in the unit had a history of recent influenza vaccination. Although it could not be determined whether the virus was introduced by a visitor or by HCP, 10 (71%) of the 14 HCP who reported influenza-like illness during the outbreak period worked while ill.</p>
<p>Weinstock D.M., et al.: Control of influenza A on a bone marrow transplant unit. <i>Infect Control Hosp Epidemiol</i> 21:730–732, Nov. 2000.</p>	<p>Bone marrow transplant unit</p>	<p>1 week</p>	<p>The outbreak occurred in the adult bone marrow transplant (BMT) unit, with 7 cases of health care–associated influenza; 6 patients also developed pneumonia, and 1 patient died. Five staff members developed influenza-like illness during the outbreak. Multiple measures were instituted to control the outbreak, including postponement of all nonessential admissions, discontinuing the practice of “floating” non-BMT staff to the unit, and offering influenza vaccine and rimantadine prophylaxis to all staff.</p>
<p>Adal K.A., et al.: Prevention of nosocomial influenza. <i>Infect Control Hosp Epidemiol</i> 17:641–648, Oct. 1996.</p>	<p>Hospital</p>	<p>69 days</p>	<p>Ten patients acquired influenza while hospitalized during the outbreak period. Patients ranged in age from 5 months to 83 years, and no clusters of cases were observed on the units. Many HCP admitted to working while they had fever and respiratory symptoms, exposing both patients and other HCP to influenza. Use of a mobile vaccination cart improved HCP vaccination rates.</p>

Continued

Appendix 2-2. Continued

Examples of Articles About Health Care–Associated Influenza Outbreaks

Reference	Setting/Outbreak Population	Duration of Outbreak	Brief Summary of Outbreak
Morens D.M., Rash V.M.: Lessons from a nursing home outbreak of influenza A. <i>Infect Control Hosp Epidemiol</i> 16:275–280, May 1995.	Long term care facility	Approximately 13 months	This outbreak occurred on one 37-bed unit of a five-unit long term care facility. During the outbreak period, 39 residents had occupied beds, of whom 11 developed clinical or proven influenza; 6 of the ill residents died. Thirty-six of the 39 residents had received influenza vaccine, as had 10 of the 11 who developed clinical influenza. Illness among HCP appears not to have been associated with illness in residents, but illness in residents may have been associated with influenza in the 3 nurses who dispensed medications or administered tube feedings. The authors suspect that HCP may have spread the virus via their hands or fomites, such as medication cart items.
Coles F.B., Balzano G.J., Morse D.L.: An outbreak of influenza A (H3N2) in a well immunized nursing home population. <i>J Am Geriatr Soc</i> 40:589–592, Jun. 1992.	Long term care facility	4 weeks	Thirty-seven of 124 residents and 18 of 146 HCP had influenza-like illness, with HCP illness beginning 16 days prior to onset in the residents. While 90% of the residents had received influenza vaccinations prior to the outbreak, only 10% of the HCP had received it. Six residents developed pneumonia, and 3 died of illness related to influenza.
Centers for Disease Control and Prevention: Outbreak of influenza A in a nursing home—New York, December 1991–January 1992. <i>MMWR Morb Mortal Wkly Rep</i> 41:129–131, Feb. 28, 1992. http://www.cdc.gov/mmwr/preview/mmwrhtml/00016138.htm (accessed Apr. 23, 2009).	Long term care facility	4 weeks	Of 337 residents of a long term care facility, 65 (19%) developed influenza-like illness; half of those infected developed pneumonia, almost one-third required hospitalization, and 2 died. Only 10% of HCP had been vaccinated before or during the outbreak, and 65 of the 339 who completed questionnaires had had an influenza-like illness during the outbreak period.

Appendix 2-2. Continued

Examples of Articles About Health Care–Associated Influenza Outbreaks

Reference	Setting/Outbreak Population	Duration of Outbreak	Brief Summary of Outbreak
Pachucki C.T., et al.: Influenza A among hospital personnel and patients. Implications for recognition, prevention, and control. <i>Arch Intern Med</i> 149:77–80, Jan. 1989.	Hospital	Not stated	This outbreak occurred in a 1,156-bed hospital, involving 118 HCP and 49 patients. Control of the outbreak occurred after vaccination of one-third of nursing personnel and physicians.
Centers for Disease Control and Prevention: Suspected nosocomial influenza cases in an intensive care unit. <i>MMWR Morb Mortal Wkly Rep</i> 37:3–4, 9, Jan. 15, 1988. http://www.cdc.gov/mmwr/preview/mmwrhtml/00001025.htm (accessed Apr. 23, 2009).	Medical–surgical intensive care unit	Not stated	Three patients in a 15-bed medical–surgical intensive care unit were identified as having influenza. A nurse who had cared for all 3 patients was absent from work due to an influenza-like illness during the time of the illness in the patients, but isolates were not available for confirmation. Neither the nurse nor the patients had received influenza vaccine.
Hall C.B., Douglas R.G.: Nosocomial influenza infection as a cause of intercurrent fevers in infants. <i>Pediatrics</i> 55:673–677, May 1975.	Infant ward for children < 2 years	Study period of 1 month duration during increased community influenza activity	Thirteen of 17 infants hospitalized during the study period developed intercurrent fevers, with 92% due to influenza. One physician subsequently identified as having influenza had worked during his first febrile day, and a number of HCP had cared for infants while ill with influenza-like illnesses or upper respiratory infections during the study period, though they were not tested for influenza.
Kapila R., et al.: A nosocomial outbreak of influenza A. <i>Chest</i> 71:576–579, May 1977.	Hospital	1 week	Eight immunocompromised patients on the same unit developed symptoms of health care–associated pneumonic influenza; none of the patients had received influenza vaccine. Five of the 8 patients died. The source of the outbreak could not be identified, and no HCP developed clinical symptoms of influenza.

CHAPTER

3

Improving Vaccination Rates

Although the influenza immunization rates of health care personnel (HCP) reported in the literature are low, and many factors influence HCP decisions to accept or decline the vaccine each year, there is great opportunity to learn the reasons for low vaccination rates, better understand the multiple influences at play, and test strategies to raise the rates of HCP immunization. This chapter examines various strategies and factors associated with improving HCP immunization rates identified in the literature and from health care organizations participating in The Joint Commission project Strategies for Implementing Successful Influenza Immunization Programs for Health Care Personnel, in response to its open call in 2008.

Influenza Vaccination Campaigns

Influenza vaccination campaigns must be conducted annually because new strains of influenza virus circulate each year, and antibody levels only last through one influenza season. The Centers for Disease Control and Prevention (CDC) recommends an approach that includes the following elements¹:

- Educating HCP
- Offering influenza vaccine to all eligible HCP
- Providing free vaccine at the work site, using strategies that have been demonstrated to increase influenza vaccination, such as the following:
 - Using vaccination clinics
 - Using mobile carts
 - Ensuring access to vaccination during all work shifts
 - Using organizational leaders as supportive role models
- Obtaining signed declinations from HCP who have nonmedical reasons for declining the vaccine
- Using HCP influenza vaccination levels as a measure of an organization's patient safety program.

Similarly, the Society for Healthcare Epidemiology of America (SHEA), the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC), and the National Foundation for Infectious Diseases (NFID) also support the use of multifaceted programs that include all the elements listed above.²⁻⁴ See Table 3-1 on pages 30–33 for a summary of the strategies supported by APIC, CDC, NFID, and SHEA, as well as The Joint Commission's requirements, for improving HCP influenza vaccination rates.

**Table 3-1. Improvement Strategies or Requirements—
The Joint Commission and the Project’s Collaborating Organizations***

Strategy	The Joint Commission [†]	APIC [‡]	CDC (HICPAC/ACIP) [§]	NFID	SHEA [#]
Offer vaccine annually	Annual vaccination program is offered to HCP.**	Require annually for all HCP who provide direct patient care	Offer annually to HCP to protect staff, patients, and family members and to reduce absenteeism.	Repeat the influenza program annually	All HCP should receive influenza vaccine annually unless it is contraindicated or they actively decline.
Multifaceted programs		Implement 2006 HICPAC and ACIP recommendations.	Successful HCP vaccination programs are multifaceted.	No single strategy is sufficient; successful programs have included multiple interventions.	All health care organizations should provide annual multifaceted programs.
Education	Educate HCP and staff about, at a minimum, the influenza vaccine; nonvaccine control and prevention measures; and the diagnosis, transmission, and impact of influenza.	Implement 2006 HICPAC and ACIP recommendations.	Basic knowledge regarding influenza and the vaccine has been associated with receipt of the vaccination.	Provide education and reeducation.	<ul style="list-style-type: none"> ■ Provide targeted education about the severity of influenza illness, especially in high-risk patients. ■ Provide targeted education about vaccine efficacy and safety and dispel vaccine myths.
Campaigns/marketing		Implement 2006 HICPAC and ACIP recommendations.	Organized campaigns that promote vaccine can improve vaccination rates.	Use all possible means to deliver messages, including e-mail alerts, articles, posters, or personal announcements.	Consider using proven tools as part of the vaccination program, such as mobile carts, continuous educational campaigns, visible vaccination of leaders, off-hours clinic, and the like.

Table 3-1. Continued
Improvement Strategies or Requirements—
The Joint Commission and the Project’s Collaborating Organizations*

Strategy	The Joint Commission†	APIC‡	CDC (HICPAC/ACIP)§	NFID¶	SHEA#
Role models		Implement 2006 HICPAC and ACIP recommendations.	Vaccination of senior medical staff or opinion leaders can improve vaccination rates in members under their leadership.	See “Commitment from leadership,” page 33.	See “Campaigns/marketing,” page 30.
Improved access to vaccination	Provide influenza vaccination at sites accessible to HCP.	Implement 2006 HICPAC and ACIP recommendations.	Provide the vaccine at convenient times and places where HCP congregate using mobile carts, such as during conferences; offer incentives.	Make influenza vaccine easily accessible by using methods such as rolling carts, providing vaccinations around department meetings and in vaccine clinics, or by using “flu deputies.”	Improve access to vaccine (e.g., mobile carts, off-hours clinics).
Provide vaccine at no cost		Implement 2006 HICPAC and ACIP recommendations.	Removing cost barriers can improve vaccination rates.	Providing vaccine to HCP at no cost shows commitment to this patient safety program.	Provide vaccine at no cost to HCP.
Measurement/improvement	<ul style="list-style-type: none"> ■ Annually evaluate vaccination rates and the reasons given for declining influenza vaccination. ■ Take steps to increase influenza vaccination rates. 	Implement 2006 HICPAC and ACIP recommendations.	<ul style="list-style-type: none"> ■ HCP influenza vaccination coverage should be regularly measured, by facility area or by occupational group. ■ HCP vaccination rates should be used as an organizational quality measure in states mandating public reporting of HAIs.** 	One way to measure is to track doses and calculate the percentage of HCP who have been immunized. Tracking by location can also be useful.	Accurately track and record HCP vaccination rates at the individual and unit levels, including those obtained outside the organization’s program.

Continued

**Table 3-1. Continued
Improvement Strategies or Requirements—
The Joint Commission and the Project's Collaborating Organizations***

Strategy	The Joint Commission[†]	APIC[‡]	CDC (HICPAC/ACIP)[§]	NFID	SHEA[#]
Feedback		Implement 2006 HICPAC and ACIP recommendations.	HCP influenza vaccination coverage should be regularly reported, with ward-, unit-, and specialty-specific rates given to staff and administration.	Vaccinated HCP should know that their efforts are appreciated, and those not vaccinated should know why they should be vaccinated. Departments with good participation should be recognized.	
Signed declinations		Require informed declinations from HCP declining for reasons other than medical. Use information from declinations to develop improvement strategies for the next vaccine season.	Signed declinations can assist organizations in identifying HCP who may need more education or other interventions to overcome barriers to vaccination.		Active declination policy should be used for HCP who do not want or cannot receive the vaccine.
Policies				Create a policy statement affirming organizational commitment to increasing HCP vaccination rates.	
Program leader				Someone or some group must be in charge of the program to make it successful.	

Table 3-1. Continued
Improvement Strategies or Requirements—
The Joint Commission and the Project’s Collaborating Organizations*

Strategy	The Joint Commission [†]	APIC [‡]	CDC (HICPAC/ACIP) [§]	NFID ^{//}	SHEA [#]
Commitment from leadership				Commitment from top management through resource allocation, by accepting the vaccination themselves and by assisting in the program in visible ways demonstrates their belief in the importance of the program.	Administrative support and leadership should be provided, including financial support and human resources.
Survey for health care–associated influenza					Each organization should have a surveillance system to capture data on health care–associated influenza to assess the success of the program.

* Collaborating organizations in The Joint Commission’s Strategies for Implementing Successful Influenza Immunization Programs for Health Care Personnel Project were the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC), the Centers for Disease Control and Prevention (CDC), the National Foundation for Infectious Diseases (NFID), and the Society for Healthcare Epidemiology of America (SHEA).

† The Joint Commission: *2009 Comprehensive Accreditation Manual for Hospitals (CAMH): The Official Handbook*. Oakbrook Terrace, IL: Joint Commission Resources, 2009. Infection Prevention and Control Standard; Standard IC.02.04.01. The standard (for hospitals, IC.02.04.01) can be viewed at http://www.jointcommission.org/NR/rdonlyres/38BEBD6D-59D7-4314-9E2B-3C4571F92159/0/HAP_IC.pdf (accessed Feb. 9, 2009).

‡ Association for Professionals in Infection Control and Epidemiology, Inc.: *APIC Position Paper: Influenza Immunization of Healthcare Personnel*. 2008. http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC_Position_Paper_Influenza_11_7_08final_revised.pdf (accessed Apr. 23, 2009).

§ Pearson M.L., Bridges C.B., Harper S.A.: 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 Recomm Rep* 55:1–16, Feb. 24, 2006. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm> (accessed Nov. 14, 2008).

// National Foundation for Infectious Diseases: *Improving Influenza Vaccination Rates in Health Care Workers: Strategies to Increase Protection for Workers and Patients*. 2004. <http://www.nfid.org/pdf/publications/hcwmonograph.pdf> (accessed Nov. 14, 2008).

Talbot T.R., et al.: SHEA position paper: Influenza vaccination of healthcare workers and vaccine allocation for healthcare workers during vaccine shortages. *Infect Control Hosp Epidemiol* 26, Nov. 2005. http://www.shea-online.org/Assets/files/position_papers/HCW_Flu_SHEA_Position_Paper.pdf (accessed Nov. 14, 2008).

** HCP: health care personnel; HAIs: health care–associated infections

Text Box 3-1. Using a Team Approach

Three organizations describe how they use a team approach to plan or oversee their programs to immunize HCP against influenza:

- NorthBay Healthcare Group in Fairfield, California, provides care in a number of settings, including hospitals, clinics, and home care. The organization has a multidisciplinary Influenza Task Force, whose members include a vice president champion and representatives from the departments of employee health, occupational health, infection prevention, pharmacy, marketing, and public relations, as well as from the Center for Primary Care. The task force meets before the start of the influenza season to begin planning their strategies for the fall campaign. It meets again at the conclusion of the season to discuss any lessons learned and write a summary performance improvement report that is submitted to the Quality Council.
- Spencer Hospital is a 99-bed hospital in Spencer, Iowa. Its Influenza Task Force has representation from administration and several members from key departments (infection prevention, employee health, and pharmacy, plus a public health immunization nurse). The task force determines vaccination goals for the upcoming influenza season, selects the campaign's theme, discusses campaign strategies, determines the incentives to use, and discusses any other issues pertinent to the campaign.
- St. Luke's hospital and clinics in Duluth, Minnesota, uses an Influenza Vaccination Committee to plan strategies for the upcoming influenza season. This committee includes the hospital epidemiologist, who is an infectious disease physician, and a clinical nurse specialist/nurse practitioner who chairs the organization's immunization committee and works closely with the infectious disease physicians. Other members include administrative representatives from nursing, the primary care clinics, and the departments of pharmacy, public relations, occupational health, home care, urgent and emergency care, and infection prevention.

Many agree that there is no “one size fits all” approach when it comes to strategies for improving vaccination rates. The intervention strategies an organization uses in its influenza vaccination program, and how those strategies are implemented, should be based on an understanding of HCP knowledge of and concerns about the vaccine.⁵⁻⁹ Such understanding facilitates the development of customer-driven interventions to enhance HCP vaccination.¹⁰

Simply having the influenza vaccine available is usually not enough, in and of itself, to entice HCP to accept vaccination. In fact, Pottinger and Herwaldt make the following observations from the literature¹¹:

- Organizations that offer the vaccine without actively promoting it have had acceptance rates of 5% to 19%.
- Organizations that actively promote the vaccination have had acceptance rates of 26% to 54%.
- Organizations that have active promotional campaigns year after year have reported acceptance rates of 61% to 97%.

In general, multifaceted campaigns are more successful than those employing a single approach.^{1,12-14} Talbot suggested using a “bundled” strategic approach to promoting influenza vaccination, similar to an approach used in campaigns to prevent health care-associated infections. Such an approach might include the following elements¹⁵:

- Free vaccinations
- Easy access to vaccinations
- Leaders emphasizing the importance of vaccinations
- Use of informed declinations
- HCP education that stresses patient safety as a reason for accepting vaccination

Multifaceted campaigns do not have to be complicated, burdensome, or expensive to implement. Ohrt and McKinney found that offering vaccination at convenient times and locations was most important to the medical house staff and students they surveyed.¹⁶ Doebbeling et al. found that focusing improvement strategies on groups identified as having low rates of influenza immunization increases the likelihood of success.¹⁷ And in a national survey of 50 hospitals, Talbot et al. found that providing the vaccinations on weekends, using train-the-trainer programs, reporting vaccine acceptance rates to administrators and the board of trustees, sending HCP a letter from administration emphasizing the importance of vaccination, and having any form of visible leadership support for the program was associated

with higher vaccination rates than noted by organizations that did not use such strategies.¹⁸

Involvement of a multidisciplinary team in the development and promotion of the influenza vaccination program helps to ensure a well-supported and successful campaign.¹⁹ Also important is the ongoing assessment of HCP vaccination programs to evaluate their overall effectiveness.¹⁵ No matter what strategies are chosen, the goal should be to improve influenza vaccination rates. Text Box 3-1 on page 34 describes the team approach used by three organizations that participated in this Joint Commission project.

Ensuring Leadership Support

The importance of leadership involvement in and support of vaccination programs and campaigns to promote them cannot be overstated. Organizational leaders can ensure, for example, that policies are in place, cost and barriers to access are reduced or eliminated, and a culture exists in which the vaccination is not only encouraged but expected as an important component of patient and HCP safety.^{2,8,12,20} Polgreen et al. point out that organizations that implement multiple interventions, such as mobile carts, to improve access to the vaccine and educational efforts to promote acceptance of the vaccine often see the resulting improved immunization rates as a reflection of administrative support and leadership.²¹

Text Box 3-2 on page 36 features two organizations that participated in this Joint Commission project. Both have exhibited the kind of leadership involvement and support needed for a successful HCP vaccination program.

Public health and professional organizations have recommended a variety of strategies that can be used in HCP immunization programs to improve influenza vaccination rates. Several of these strategies are discussed in the following sections.

Education of HCP

The educational component of an influenza vaccination program is likely to require more extensive planning and more time to implement than any other campaign component.⁸ Content of the education will need to be decided, as well as how it will be delivered (Will presentations be live or shown via video/DVD? Will there be online self-learning modules? Will printed materials be part of the education?).

The CDC recommends that the following basic information be provided to HCP as part of any educational effort¹:

- The benefits of influenza vaccination
- The potential impact and severity of influenza illness for HCP and their patients
- The epidemiology of influenza, and its modes of transmission, diagnosis, and treatment
- Nonvaccine infection control strategies, such as antiviral medications, isolation precautions, and so on

Some authors believe vaccination education should cover additional subjects, such as the safety and efficacy of the vaccine.^{2,22} The SHEA position paper states that the ethical responsibility of HCP to protect themselves as well as their patients and coworkers should be emphasized.² Based on their experiences with HCP admitting to working with fever and respiratory symptoms, Adal et al. state that educational programs should also inform HCP of the importance of staying home from work when they have contracted influenza-like illness, no matter how mild the case.²³

Education of HCP, which reduces misinformation and misconceptions about influenza disease and the vaccine, has been associated with acceptance of the vaccine by HCP.^{24–26} Planning successful educational efforts depends on understanding the varying levels of knowledge, perceptions, and attitudes about influenza and the vaccine among HCP. Begue and Gee found that when all the concerns of HCP were addressed during educational sessions, their influenza vaccination rates rose from 21% to 38%, an increase of 50%.²⁷ Text Box 3-3 on page 37 provides examples of how two organizations participating in this Joint Commission project who, to help plan their educational programs, have sought to understand the reasons that their HCP gave for receiving, or not receiving, the influenza vaccination.

Several authors have concluded that tailoring education to address the concerns of the intended audience is more likely to result in improved vaccination rates than not focusing their educational efforts in that way.^{8,9,13,20,27–29} The following studies provide some examples:

- Christini et al. studied vaccination acceptance patterns among different groups of HCP at two tertiary care facilities and found that each group had different reasons for accepting or declining vaccination. The researchers

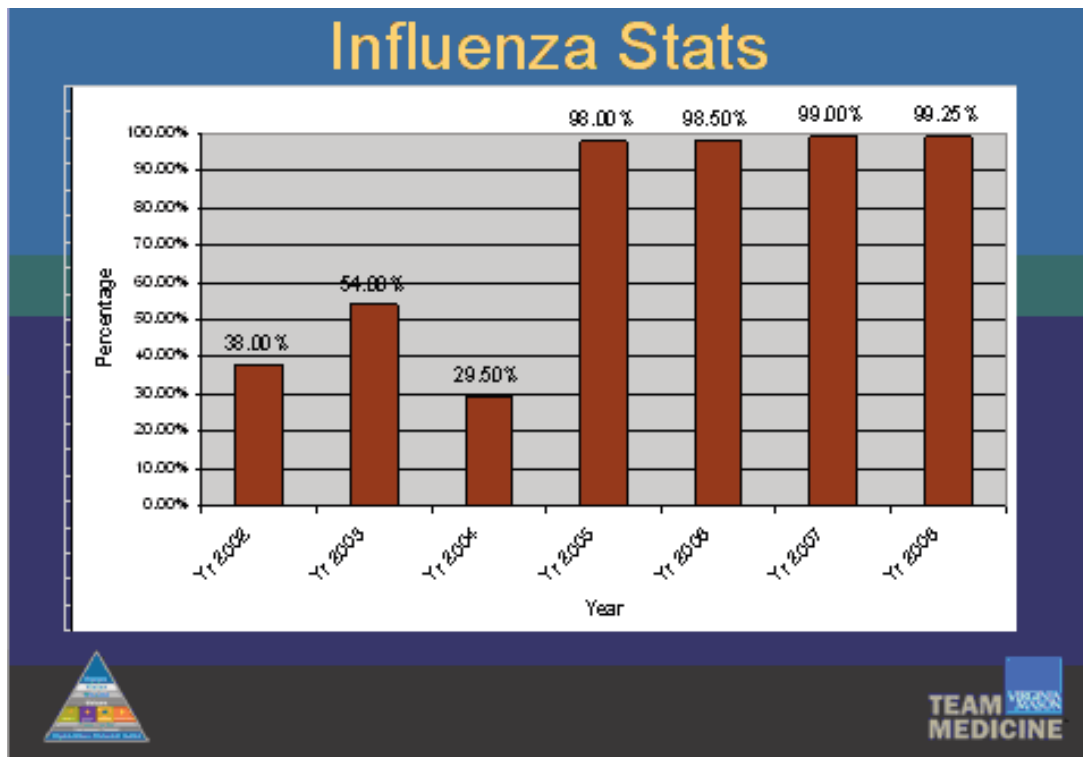
Text Box 3-2. Leadership Support

■ Beverly Hagar, supervisor of employee health at Virginia Mason Medical Center in Seattle, attributes the success of the organization's HCP influenza immunization program to the support of senior leadership, the board of directors, and the "flu" team. (Beverly Hagar, personal communication, Feb. 9, 2009). The first health care organization in the United States to mandate influenza vaccinations as a condition of employment, Virginia Mason Medical Center allows no written declinations. Instead, HCP submit a written "request for accommodation," which can be granted only for medical contraindications or religious objections. Each written request is carefully evaluated by an oversight group, and those whose requests are determined to be acceptable must wear a mask during work hours for the

duration of the influenza season. Nine HCP had their employment terminated as a result of the policy, though none has contested the dismissal. Their influenza vaccination rate has improved from 38% in 2002 to 99% or higher since the mandatory vaccination program was implemented in 2005 (see Figure 3-1, below).

■ Another organization that has a clear directive from its leadership is Community Health Care, Inc., an ambulatory care organization headquartered in Davenport, Iowa. Employing more than 200 HCP, Community Health Care provides medical and dental care in six locations throughout the Quad Cities in Davenport, Iowa, and Rock Island and Moline, Illinois. The organization's CEO and board of directors charged the infection control committee with

Figure 3-1. Vaccination Rates, 2002–2008



Source: Virginia Mason Medical Center, Seattle.

Text Box 3-2 continued from previous page

developing an influenza campaign to improve vaccination rates among their HCP. To keep the voluntary program from becoming mandatory, they had to vaccinate at least 90% of the staff during the 2008–2009 influenza season. The campaign planners added mobile carts, more convenient vaccination times and locations, a revamped education program, and a campaign slogan contest. They not only reached, but exceeded, their goal: 94% of HCP were vaccinated against influenza in 2008–2009, up from the 65% to 70% vaccinated between 2005 and 2007.

propose that education be tailored to specific groups of HCP, such as nurses, physicians, technicians, and aides, based on their historic vaccination rates.²⁹

- Begue and Gee found that all their pregnant HCP refused the vaccination, despite the CDC's statement that the vaccine is recommended during pregnancy. Because these HCP usually declined the vaccine after they had consulted their obstetricians, the researchers identified the need for additional education aimed at physicians, including obstetricians, who care for specific populations.²⁷
- Goldstein et al. conducted a statewide survey of 268 health care organizations in North Carolina, including hospitals, home health agencies, dialysis centers, assisted living centers, and long term care facilities. Finding that educational messages to improve vaccination rates among HCP in assisted living centers or dialysis centers could be different from those used in hospitals or long term care facilities, they concluded that educational efforts could be tailored to the institution.¹³
- Gazmararian et al. found that organizations that included personal contact as a component of their educational efforts had higher vaccination rates than those that relied solely on printed materials.³⁰

Text Box 3-4 on page 38 provides an example of how one organization tailored education to its HCP.

Text Box 3-3. **Planning Education Based on HCP Needs**

- In its past HCP educational efforts, Community Health Care, Inc., an ambulatory care organization headquartered in Davenport, Iowa, highlighted protecting the patient as the reason HCP should be immunized against influenza. After the 2007–2008 influenza season, Community conducted a survey of its more than 200 HCP, asking those who had received the vaccination what motivated them to accept it. With a 70% response rate, the two overwhelming reasons they gave for accepting the vaccine were to (1) protect themselves and their families and (2) to avoid having to use their paid time off for illness. Campaign planners used this information when developing the educational component of the vaccination campaign for the 2008–2009 influenza season. This was one of the aspects of the program that helped to improve vaccination acceptance rates from a baseline of 65%–70% during the 2005, 2006, and 2007 seasons to 94% in 2008–2009.
- In the summer of 2008 Sanford Medical Center in Sioux Falls, South Dakota, surveyed HCP who accepted the influenza vaccine for the first time in 2007 to learn what motivated them to accept it. They found that HCP were influenced by the message that it was their responsibility as HCP to receive the vaccine to protect themselves and others. Accessibility to the vaccine and the organizational message to receive the vaccine were also key influences. They used this information to plan their 2008 staff education programs with the “ONE Thing” campaign slogan, emphasizing that getting the vaccination is the “ONE thing” they can do to prevent the spread of influenza.

Ofstead et al. surveyed 513 nurses at Mayo Clinic in Rochester, Minnesota, who had received education about influenza and the vaccination as part of a long-standing and multifaceted program. The researchers found that only

Text Box 3-4. Tailoring Education to HCP

During the 2006–2007 and 2007–2008 influenza seasons, Beaufort Memorial Hospital in Beaufort, South Carolina, had seen influenza vaccination acceptance rates hover in the upper 40% range for its approximately 1,200 HCP. One way the organization increased the vaccination acceptance rate in 2008 was by having the employee health nurse add a question to the annual employee health questionnaire, asking if the HCP had received the influenza vaccine during the past influenza season. For those who said they had not received the vaccine, she provided one-on-one education about the vaccine and its importance. For those who said they had received it, she gave positive reinforcement. This was one of the strategies the hospital used to improve its vaccination rate to 66% during the 2008–2009 influenza season.

Text Box 3-5. Targeting Interventions

Cleveland Clinic in Cleveland, Ohio, developed an intranet program to capture the organization's influenza vaccination rates. Beginning with the 2005–2006 influenza season, HCP accessed the intranet and selected either “vaccine received,” “contraindicated,” or “declined.” The database permits real-time monitoring of vaccination rates by location, which facilitates targeted interventions in subgroups of HCP whose rates are lower. For example, when the infection preventionist noticed low participation and vaccination among staff in the solid organ transplant unit, she addressed the concern with senior transplant surgeons; as a result, a “catch-up” vaccination effort was provided in February 2006.

Source: Bertin M., et al.: *Novel use of the intranet to document health care personnel participation in a mandatory influenza vaccination reporting program.* Am J Infect Control 35:33–37, Feb. 2007.

about two-thirds of those who said they had received all the information they needed intended to receive the vaccine.³¹ Other researchers have also concluded that education alone may be insufficient to improve rates of vaccination.^{9,25,32}

Social Marketing

The Social Marketing Institute defines *social marketing* as “the planning and implementation of programs designed to bring about social change using concepts from commercial marketing.” It is an approach to changing behavior that is used by organizations such as the Agency for Healthcare Research and Quality, the CDC, the American Cancer Society, the AARP (formerly the American Association of Retired Persons), and many others. The social marketing approach disseminates information with the goal of changing individual behavior to realize a future benefit.³³ Examples of social marketing campaigns are those conducted by the Ad Council to reduce teenage smoking, drinking, and drug use. Articles focusing on how the tools of social marketing are being used to influence HCP behavior have been published in the infection prevention literature.^{10,34}

Social marketers aim to understand the perceptions, needs, and wants of individuals. Their goal is to persuade people to behave in ways that will be of individual, as well as collective, benefit.³³ They segment target populations according to the motivations and perceptions that underlie individual behaviors rather than using a single approach to a population.¹⁰ Infection preventionists can, for example, use different customer-driven strategies with different groups and decide which groups to target to maximize limited resources. Mah et al. described how they used the social marketing approach to better understand HCP perceptions, motivations, and preferences surrounding influenza vaccinations at a Canadian cancer center. They found that HCP perceptions of the influenza vaccination differed by past frequency of vaccine acceptance (that is, no participation, moderate participation, or frequent participation) and planned their vaccination promotion strategies based on these differences.¹⁰

A social marketing campaign may include conducting surveys to capture information about HCP attitudes and beliefs about influenza vaccination and what motivates them to receive or decline it. Results can then be used to design a campaign targeted to the most resistant HCP. Text Box 3-5,

at left, describes how one organization used its intranet to gather useful information about vaccination acceptance rates and target interventions accordingly.

Getting the Message Out

Health care personnel need to know when and where education will be offered or is available, when and where the vaccinations will be provided, and the importance of getting the vaccination. Promoting the vaccinations to HCP can take many forms and take place in many venues, including the following¹²:

- E-mail notices and reminders, which quickly provides information to large numbers of HCP
- Employee newsletters, which may take more time to develop than e-mail messages but which reach HCP who do not have access to e-mail. The NFID recommends publishing a series of articles during the course of the influenza season, starting with announcements of the upcoming influenza campaign and the importance of the vaccinations, followed by regular updates on acceptance rates, reminders of when and how to get the vaccine, and any policy-related issues, such as deadlines for either accepting or declining the vaccine.
- Posters, which deliver educational messages, advertise vaccination times and locations, or both
- Screen savers that remind staff to get their vaccinations
- Messages delivered in person at staff meetings or health fairs
- Stickers worn by HCP, indicating that they have received the vaccination

Organizations participating in this Joint Commission project have used many creative approaches to “get the word out” about their influenza vaccination campaigns, as described in Text Box 3-6 on pages 40–43.

Keeping the Campaign Going

The CDC recommends keeping the vaccination campaign going through the winter and spring, as influenza activity typically peaks in February and can continue until April or May.³⁵ According to the National Health Interview Survey, during the 2005–2006 and 2006–2007 influenza seasons,

approximately 84% of all vaccinations were given between September and November (see Figure 3-5, on page 44).³⁶ Because many people, including HCP, remain unvaccinated at the end of November, the CDC recommends promoting influenza vaccinations during National Influenza Vaccination Week (usually in December) and throughout the remainder of the influenza season, which can continue into April or May.³⁵ Adal et al. suggest that an opportune time to remind HCP of the importance and availability of the vaccination is early in the course of a community outbreak.²³ Text Box 3-7 on page 45 describes how two organizations keep their influenza campaigns active throughout the influenza season to maximize the number of HCP who accept the vaccine.

Convenience of and Accessibility to Vaccinations

Easy and convenient access to vaccination is likely to improve vaccination rates among HCP.^{7,9,16,20,23,26,27,30,37,38} Consider the following approaches:

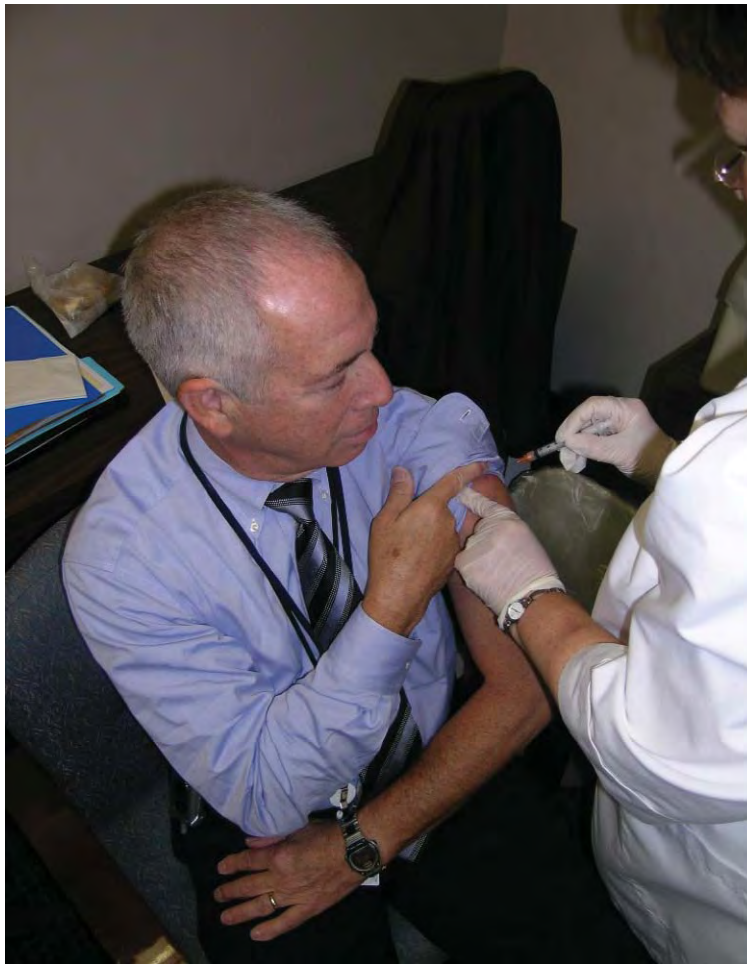
- Offer vaccinations at various times and locations; ensure that staff on all shifts, including weekends, are afforded access; offer the vaccine in common areas such as cafeterias or building entrances; and offer the vaccine when meetings are taking place and during shift changes. Offer vaccinations in the employee health office or preestablished vaccination clinics, with convenient times available for all staff on all shifts, either on a “walk-in” basis or by appointment.
- It is important to ensure a quick, streamlined process for vaccinating staff. Some organizations have preannounced “vaccine days,” during which the vaccine is offered to all staff on designated days.³² Kimura et al. found that holding one or more vaccine days combined with an educational program improved vaccine acceptance by HCP in several long term care facilities in California in 2002.³⁹
- Use of mobile carts, which involves taking the vaccine to units or departments and vaccinating HCP during their work shifts, offers not only convenience but the opportunity for face-to-face interaction with HCP and an opportunity to educate staff and answer questions. Consider the following studies:
 - Pachucki et al. used mobile carts to immunize 294 HCP working on their wards during an influenza

Text Box 3-6. Organizations Get the Word Out

■ CentraState Healthcare System in Freehold, New Jersey, holds a campaign “kickoff” with a presentation to department heads by the senior vice president/medical director and the employee health manager, followed by vaccinations at a management council meeting attended by top management. The organization uses this as a photo opportunity as part of its marketing campaign; for

example, a picture of the senior vice president/medical director receiving his vaccination appears in their October newsletter, which goes to all HCP (see Figure 3-2, below). In addition, CentraState has special T-shirts for everyone receiving an influenza vaccination, and the “vaccine deputies” can also wear them while giving the vaccinations (see Figure 3-3 on page 41).

Figure 3-2. Senior Management Sets an Example



Dr. Ben Weinstein, M.D., Ph.D., senior vice president/medical director for CentraState Medical Center in Freehold, New Jersey, receives his influenza vaccination from the employee health nurse at the management council meeting.

Text Box 3-6 continued from previous page

- Sanford Medical Center in Sioux Falls, South Dakota, has a “One Thing” campaign, with T-shirts for vaccinators and stickers for staff badges that say “I have done the ONE thing.” The campaign is based on educational themes such as “If you could do the ONE thing to prevent 36,000 deaths and 220,000 hospitalizations, would you do it?” and “If you could do the ONE thing to protect yourself, your coworkers, your patients, and your loved ones, would you do it?” and so on.
- In 2008 the Hospital of the University of Pennsylvania in Philadelphia developed the inspirational video *Baby, Be Wise—Immunize*. The hospital used HCP volunteers

Figure 3-3. Vaccine Deputy Promotes Vaccinations



Deputy Hazen, vaccine deputy for CentraState’s vaccination program, wears a T-shirt and badge promoting the influenza campaign.

Continued

Text Box 3-6 continued from previous page

and members of PennYo's Acappella Choir to sing about concerns over the vaccine's safety and efficacy, which had been gleaned from HCP signed declinations during the previous influenza season. The video is shown at "flu fairs" and is available on the hospital's intranet, television network, and YouTube (<http://www.youtube.com/watch?v=ruGgZbAVnko>).

- Loyola University in Maywood, Illinois, raises awareness of its annual influenza campaign by showing pictures of senior leadership getting their influenza vaccinations on flat-screen monitors across the campus. Along with the pictures, the monitors play a jingle about the vaccination campaign to catch the attention of HCP and add a little humor to the process of getting everyone vaccinated. It was such a success when it debuted during the 2007–2008 campaign educational sessions that staff asked whether a new video would be coming out for the 2008–2009 season. By popular demand, the video team created a two-minute DVD for the 2008–2009 season, with

lyrics sung to the tune of the "Beer Barrel Polka"; ambulatory managers and the vice president sang the refrain:

Pro-TECT our pa-tients,
Go get your flu shot to-day.
Pro-TECT our patients,
We'll wash our hands night and day.
Pro-TECT our pa-tients,
Ev'-ry one must do their part.
Now's the time to do the right thing,
Go and get your flu shot now.

- St. Luke's Hospital in Duluth, Minnesota, tried something new for its 2008–2009 campaign: It had large banners professionally made for the hospital and clinics, emblazoned with the organization's logo and the phrase "We're putting our patients' health first! We got the flu shot!"

Figure 3-4. Staff-Autographed Banners



Staff-autographed banner hangs in St. Luke's Hospital, Duluth, Minnesota, during the hospital's influenza campaign in 2008–2009.

Text Box 3-6 continued from previous page

shot!" As HCP received their vaccinations, they were offered the opportunity to sign their names to the banner with a bright pen. The banners were then hung in prominent locations (see Figure 3-4 on page 42).

- SUNY Upstate Medical University in Syracuse, New York, started something new in its 2008–2009 influenza campaign, called the “Red Dot Flu Campaign.” Everyone

receiving an influenza vaccination was given a half-inch red dot, placed on the upper-right corner of the identification card HCP wear at all times. This makes it apparent to everyone, including patients, who has (and has not) received the vaccine. This effort has been helpful in raising awareness and stimulating discussion, which has led to increased vaccination rates.

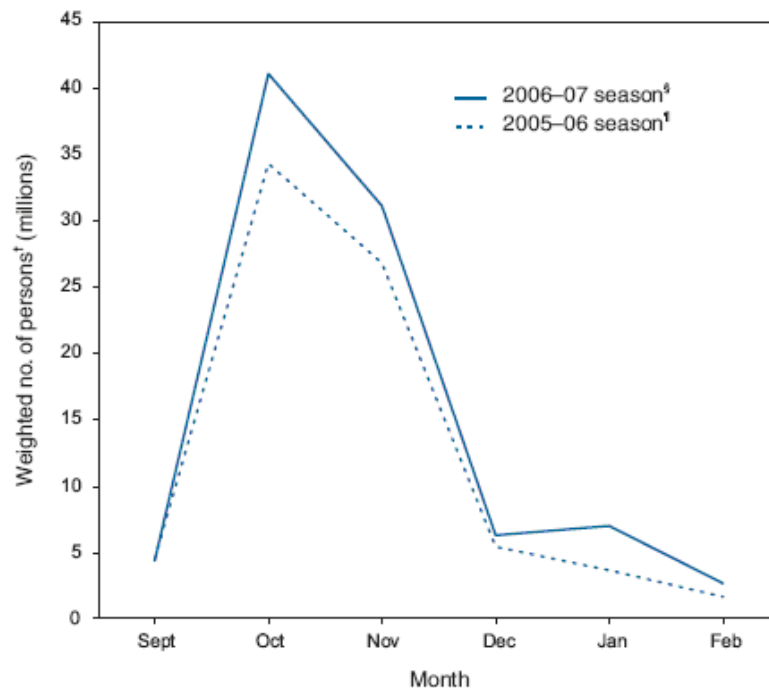
outbreak over a period of seven days; the mobile carts visited each ward at least twice on every shift. Personnel from the organization’s infection prevention department, who staffed the carts, actively sought out HCP and asked them about their immunization status; the unvaccinated staff were educated about influenza disease, its serious health consequences, and the importance of receiving the vaccination. This strategy was also used the following influenza season and was associated with a marked increase in HCP receiving the influenza vaccination.⁴⁰

- The Veterans Affairs Medical Center in Minneapolis implemented a mobile cart program in 1985, and the organization’s HCP influenza vaccination rate increased steadily from less than 25% in the early 1980s to 65% during the 2003–2004 season.³² Each year the program is reviewed and endorsed by the infection control committee, and one employee health nurse and two infection prevention nurses set aside two weeks in October to take mobile carts throughout the organization. The scheduled locations of the mobile carts are advertised to staff, and HCP are encouraged to “go to the cart” if it is more convenient for them to be vaccinated at a time and location other than the scheduled time in their own work area. Educational materials are provided prior to the arrival of the mobile carts, but the nurses also educate employees, answer their questions, and emphasize other infection prevention measures, such as hand hygiene.
- The use of peer vaccinators has been a useful component of some vaccination programs. Referred to as vaccine

deputies or “flu” deputies in some organizations, these trained HCP provide the vaccination to other HCP. The peer vaccinators are oriented to the procedures and paperwork associated with vaccine administration and seek out staff in their work areas. One group of researchers, however, did not see an association between the use of peer vaccinators and increased vaccination rates, suggesting to the researchers that the effectiveness of this strategy may depend on the motivation and commitment of individual vaccinators.²⁰ Others, including the following researchers, see peer vaccinators as useful:

- Sartor et al. used 15 vaccination teams, each comprising one nurse and one physician, to take the vaccinations to HCP in patient care areas. The teams made their visits on preannounced dates, visiting each unit at least three times on all shifts. They also targeted areas of the hospital with historically low vaccination rates, such as the physical therapy and obstetrics departments. This approach led to a significant increase in their HCP influenza vaccination rate, from 6% and 7% in 1998 and 1999, respectively, before implementation to 32% in 2000 and 35% in 2001, after implementation.³⁷
- Mayo Clinic in Rochester, Minnesota, added the Peer Vaccination Program to its existing large vaccination clinics in 2000, in an effort to vaccinate its approximately 25,000 HCP. The Peer Vaccination Program nurses vaccinated their coworkers in their respective work areas, thereby minimizing the logistical difficulties and expense associated with staffing additional vaccination clinics. This practice afforded HCP the convenience of having someone in their work area

Figure 3-5. Estimated Number of Persons Reporting Vaccination for Influenza, by Month—National Health Interview Survey, United States, 2005–2006 and 2006–2007 Influenza Seasons



* Respondents were asked two series of questions: “During the past 12 months, have you had a flu shot?” “A flu shot is usually given in the fall and protects against influenza for the flu season.” “During what month and year did you receive your most recent flu shot?” and “During the past 12 months, have you had a flu vaccine sprayed in your nose by a doctor or other health professional?” “A health professional may have let you spray it.” “This vaccine is usually given in the fall and protects against influenza for the flu season.” “During what month and year did you receive your most recent flu nasal spray?”

† Estimates are based on 1-month sampling weights.

§ Persons aged ≥ 6 months for whom month of influenza vaccination was reported in interviews conducted in March 2007.

¶ Persons aged ≥ 6 months for whom month of influenza vaccination was reported in interviews conducted in March 2006.

SOURCE: 2006 National Health Interview Survey final data and 2007 National Health Interview Survey preliminary data. Estimates for the 2006–07 influenza season might change as more data become available. Estimates are based on household interviews of the civilian noninstitutionalized population. Additional information available at <http://www.cdc.gov/nchs/nhis.htm>.

Source: Centers for Disease Control and Prevention: Notice to readers: National Influenza Vaccination Week—November 26–December 2, 2007. *Morb Mortal Wkly Rep* 56:1216–1217, Nov. 23, 2007. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5646a3.htm#fig> (accessed Feb. 9, 2009).

able to vaccinate them. Despite vaccine shortages that year, they were able to vaccinate more than 42% of their HCP.³²

Whatever approaches you use to make the vaccine more accessible, offer it as many times as possible and at varying times over all shifts, rather than once or a small number of times, to help reach the most staff.

Text Box 3-8 on page 46 cites examples of how some organizations ensure that HCP have ready access to vaccinations at convenient times and locations.

Free Vaccinations

By assuming the cost of the vaccine for their HCP, organizations indicate their support for and commitment to this important infection prevention and patient safety strategy.¹² Providing vaccine at no cost removes yet another barrier to vaccination and has been recommended by the CDC,¹ NFID,⁴ and SHEA.² When Steiner et al. conducted a survey of HCP in their hospital to evaluate factors associated with acceptance of influenza vaccination and willingness to pay for the vaccine, one-third said they would not be willing to pay anything out-of-pocket.⁴¹ Song et al. saw their vaccination rates increase from 42% in 2002–2003 to 78% in 2003–2004 when they switched from offering the vaccine “at cost” to offering it at no cost.⁷

Role Models

Vaccination of senior staff, organizational leaders, or opinion leaders has been associated with better vaccine acceptance rates among HCP. Sartor et al. demonstrated a significant association between vaccination of the chief or associate professor of a large teaching hospital in France and vaccine acceptance by medical staff.³⁷ Nafzinger and Herwaldt surveyed the attitudes of internal medicine residents at two Iowa hospitals about their reasons for accepting or declining the influenza vaccine; they found that faculty, especially infectious disease physicians, appeared to increase vaccine acceptance among residents by establishing a social norm.²⁶ The influence of attending physicians on behavior has also been noted in the hand hygiene literature.^{42,43}

Stamford Hospital in Stamford, Connecticut, announces the kickoff of its influenza campaign with a picture of the hospital’s CEO getting the first vaccination of

Text Box 3-7. Organizations with Season-long Campaigns

- Campbell County Memorial Hospital in Gillette, Wyoming, had vaccinated 83% of its HCP by mid-January 2009, but the hospital has a “final push” each year at the end of January–early February to encourage HCP who have not yet received the vaccine to accept it. The employee health nurse sends each manager a list of HCP who need the vaccine or who need to show proof of vaccination from another source, a copy of which is sent to the manager’s vice president. Managers can then follow up with their staff. Vaccinations are available to HCP throughout the influenza season, as long as the vaccine supply lasts.
- CentraState Healthcare System in Freehold, New Jersey, conducts an “It’s Not Too Late” campaign each January to spotlight vaccinations for HCP. It offers a gift-card incentive via a raffle drawing throughout the campaign for HCP who receive their vaccination, although the earlier in the campaign staff receive the vaccinations, the higher the value of their gift cards. During the 2008–2009 influenza season the employee health nurse also “advertised” the resistance of the influenza virus to the antiviral drug oseltamivir, which motivated some worried staff to come in for the vaccine after the first of the year.

the season, which the hospital publicizes in the weekly staff news update (see Figure 3-7 on page 47).

Declinations

The CDC’s 2006 immunization recommendations include obtaining signed declinations from HCP when they decline vaccinations.¹ SHEA’s position paper also recommends signed declinations for HCP who cannot receive the vaccine or who do not want the vaccine.² Having reluctant HCP read a declination form may cause them to reflect on their decision and perhaps lead them to participate.¹⁹ However, obtaining signed declination statements has been somewhat controversial, and limited data are available

Text Box 3-8. HCP Have Easy Access to Vaccinations

- Albert Einstein Healthcare Network in Philadelphia holds multiple vaccination clinics throughout the network, arranges to have trained unit-based vaccinators in all clinical areas, and has roving vaccination teams that visit units to ensure vaccination coverage on all shifts at all work sites.
- Catawba Service Unit in Rock Hill, South Carolina, provides ambulatory care in medical and dental offices and takes advantage of its fall staff meeting to vaccinate its 26 HCP against influenza. The staff also receives an annual tuberculin skin test at the same time.
- Rome Memorial Hospital in Rome, New York, offers influenza vaccinations at specific clinic times for approximately three weeks each fall and then seeks out unvaccinated staff by visiting units and encouraging staff to get the vaccination. The hospital has also enlisted the help of the night supervisor to vaccinate HCP on the night shift.
- Sanford Medical Center in Sioux Falls, South Dakota, is part of a large health system of clinics and affiliate hospitals that uses “roaming vaccinators” to reach HCP on all shifts, including weekends. It has developed a voucher system for HCP who do not have easy access to the vaccine, which allows them to receive the vaccine at no charge at any Sanford location close to their home. If HCP do not have ready access to a Sanford facility, they can arrange to receive the vaccine at a convenient location at no charge.
- Tri-City Regional Medical Center in Hawaiian Gardens, California, uses mobile vaccination carts to vaccinate staff by going to places where HCP are working. The medical center has also found it useful to have an influenza vaccination station available on the day HCP come in to pick up their paychecks. In addition, HCP know that a mobile cart is kept in the supervisor’s office so HCP on all shifts, including weekends, can be vaccinated.
- Beaufort Memorial Hospital in Beaufort, South Carolina, added a “roving flu vaccination cart” in 2008, staffed by nurses from the Nurse Advisory Board. The roving flu vaccination cart went to the units and other areas of the hospital on both the day and night shifts. The nurses also gave out healthy snacks, chocolate kisses, and stickers they printed from the CDC Web site (see Figure 3-6, below). The staff appreciated the convenience of having the vaccinations in their home units and departments. The hospital believes that the roving carts were a key factor in raising the 2008 influenza vaccination rate from 46% in 2007–2008 to 66% in 2008–2009.

Figure 3-6. Vaccination Sticker



Sticker printed from CDC Web site and given to Beaufort Memorial Hospital HCP after receiving their influenza vaccination.

Figure 3-7. CEO Gets His Vaccination

Stamford Hospital's president and CEO, Brian Grissler, kicks off the organization's "Fight the Flu" campaign by getting his vaccination from senior infection preventionist Brenda Grant, R.N., M.P.H., C.I.C.

regarding the effectiveness of using declinations as a strategy for improving influenza vaccination rates among HCP.⁴⁴ The American College of Occupational and Environmental Medicine has expressed concern over the use of declination statements, preferring more positive reinforcements to increase vaccination rates.⁴⁵ In a national survey of 50 hospitals, Talbot et al. did not find a significant difference in HCP influenza vaccination rates between hospitals that required a signed declination form for those refusing vaccination and those that did not.¹⁸ Others point to the success in raising hepatitis B vaccination rates among HCP to 71% by incorporating, among other things, signed declination statements when organizations began implementing the Occupational Safety and Health Administration's 1991 Bloodborne Pathogen Standard requirements.^{46,47} Willis and Wortley point out that the signed declinations can help identify HCP needing additional education.⁴⁸ Many agree that there is an association between use of declination state-

ments and improved influenza vaccination rates; a few examples follow:

- Polgreen et al. describe a study by the Infectious Diseases Society of America Emerging Infections Network in which 22 health care organizations implemented declination policies. An analysis of influenza vaccination rates both before and after implementation of the policy revealed a statistically significant mean increase of 11.6% ($p = .001$); 18 of the 22 organizations had also concurrently implemented other strategies aimed at increasing rates, such as new vaccination locations or educational campaigns. The researchers found that organizations with relatively lower vaccination rates prior to implementation of the declination policy tended to have greater increases in vaccination rates after the policy was introduced than did organizations that had relatively higher vaccination rates. Although declinations were

considered mandatory in 13 of the 22 organizations, there were no penalties for HCP who did not sign the declinations.⁴⁴

- In an earlier publication, Polgreen et al. described a survey of almost 1,000 infectious disease consultants regarding their vaccination programs and rates. They found that while influenza vaccination rates were significantly higher in organizations requiring HCP to sign declinations ($p = .004$), such declinations were not commonly used in the 2005–2006 influenza season and were actually one of the least implemented of the CDC’s 2006 recommendations.²¹
- During the 2006–2007 influenza season, Ribner et al. introduced a form that included the vaccination consent, medical contraindications for the vaccine, and reasons for declining the vaccine in a health care system with more than 9,000 employees. The overall vaccination rate improved from 43% of all HCP in 2005–2006 to 66.5% during the 2006–2007 season. While they had also implemented other measures to improve their vaccination rates and therefore could not attribute the increase solely to the use of the new forms, they were able to use the reasons for declining the vaccine that were captured on the forms to plan their strategies for future campaigns.⁴⁹
- Bertin et al. describe an influenza vaccination program in their large tertiary care health care system. Between 1997 and 2003, they consistently averaged below the 38% national HCP vaccination rate. Beginning with the 2004–2005 influenza season, a year of vaccine shortages, HCP were required to complete a paper form on which they either accepted or declined the vaccination; vaccination rates increased to 38.2%. Beginning with the 2005–2006 season, HCP had to log onto the intranet and select either “vaccine received,” “contraindicated,” or “declined”; if they declined, a screen with education about vaccination would appear. In that year, 55% indicated “vaccine received.” The authors stated their belief that requiring HCP to either sign the declination form or to accept the vaccination showed the organization’s commitment to the influenza vaccination program and motivated many HCP to accept vaccination for the first time that year.⁵⁰

- Borlaug et al. describe their survey of Wisconsin hospitals and long term care facilities as part of the Wisconsin Division of Public Health’s statewide program to improve influenza vaccination rates among HCP working in those facilities. The researchers found small but significant associations between facilities requiring signed declinations and better vaccine acceptance rates, as follows⁵¹:
 - Of the 103 hospitals that reported influenza vaccination rates, 15 used signed declination forms. HCP vaccination rates were higher in hospitals that required the signed forms than in those that did not (65% versus 56%; $p = .02$).
 - Of the 268 long term care facilities that reported influenza vaccination rates, 43 used signed declination forms; rates of HCP vaccination among long term care facilities requiring the signed forms were higher than vaccination rates in those that did not (50% versus 30%; $p = .01$).

Talbot identifies the following key facets of declination forms that influence their effectiveness¹⁵:

- Having a statement stressing that the HCP has received education regarding the rationale for the vaccination and that declining the vaccination puts patients at risk. This has a greater impact than a simple “yes or no” declination.
- Having consequences for failure to sign the declination
- Having a statement about the organization leadership’s expectations and the importance they place on vaccination

Managing declinations can be resource intensive, so if they are used within an influenza vaccination program, consideration should be given to who will track them and how. But written declinations do provide valuable information that influenza vaccination program planners and program managers can use to select appropriate strategies for improving vaccination rates. Organizations participating in this Joint Commission project that have used declinations to improve their influenza vaccination rates are highlighted in Text Box 3-9 on page 49. As you can see from these examples, organizations that have established one-on-one contact

Text Box 3-9. Declinations Improve Vaccination Rates

- Campbell County Memorial Hospital, a 90-bed acute care hospital in Gillette, Wyoming, began requiring HCP to either receive the vaccination or decline in 2007–2008. While they offer the vaccination during scheduled influenza clinics, use mobile vaccination carts, and have vaccine available on all nursing units, HCP who do not want the vaccine can decline only by going to the employee health office. The employee health nurse first provides individualized education on influenza disease and the vaccine’s effectiveness and safety. If HCP still wish to decline, a reason for doing so must be stated. The reasons for HCP declining the vaccine are tabulated at the end of the influenza season and used when planning the educational component of the next influenza campaign. Vaccination rates have steadily increased from 43% in 2005 to 92% in 2008–2009.
- St. Louis University Hospital (Tenet) in St. Louis uses employee health clinic and mobile vaccination personnel to make the vaccination available to its 1,750 HCP. Beginning with the 2007 influenza season, the organization required HCP to either accept the vaccination or formally decline in person at the employee health office. Declinations are entered electronically by the employee health nurse, so this process is centrally managed and controlled. Failure of HCP to accept the vaccination or complete the declination process by a preset deadline results in their payroll being locked down so they cannot “clock in” again until they do so. With this program, called “Not So Inclined to Decline,” the hospital’s vaccination rates have steadily improved from 34% in 2004–2005 to 67% in 2008–2009.
- The Chattanooga-Hamilton County Health Department in Chattanooga, Tennessee, strives to vaccinate its more than 280 HCP each year. Beginning in 2006, it developed a formal educational program and implemented a declination form, requiring health department HCP to either take the vaccine or sign the form. The vaccination rates improved from 58% in 2004–2005 to 62% in 2005–2006 and approximately 80% in 2006–2007 and 2007–2008.
- Cleveland Clinic implemented an intranet program in 2005, available on all of the organization’s computers and workstations, to capture the vaccination status of 20,000 HCP. The program was expanded in 2008 to include more than 38,000 HCP who work in the 10 hospitals that comprise the Cleveland Clinic Health Care System. HCP are required to access the Web site and select either “vaccine received,” “vaccine contraindicated,” or “declined;” if the “declined” field is selected, an educational screen about the vaccination appears. Cleveland Clinic vaccination acceptance rates increased from 38% in 2004–2005 to 55% in 2005–2006, with rates remaining in the 50% range in subsequent years.
- Loyola University Health System in Maywood, Illinois, had seen the influenza vaccination acceptance rate among its 7,700 HCP increase gradually from 35% to 51% in 2005, then level off at 61% in both 2006–2007 and 2007–2008. Determined to improve those rates, in 2008, the organization implemented an online declination process that tracks HCP by job description. Vaccination rates improved to 73% the first year this process was used, and the reasons stated for declining the vaccination will be used in planning next season’s influenza education.
- Stamford Hospital in Stamford, Connecticut, requires its 2,400 HCP to complete a mandatory education module that includes information on influenza and the vaccination. Beginning with the 2008–2009 influenza season, HCP were required to either accept the vaccination or sign a declination form. Failure to do either negatively affects the HCP performance review. Vaccine acceptance rates, which had been in the low 50% range since 2004–2005, increased to 64.7% in 2008–2009.

Text Box 3-10.
Cigna Medical Group

Cigna Medical Group in Phoenix is a multispecialty medical group practice, a division of CIGNA HealthCare, CIGNA Corporation, with 25 locations and 1,700 HCP throughout the Phoenix Valley. Assistance in managing the influenza vaccination program comes from “flu coordinators,” with one coordinator assigned to each location. Each fall the Flu Committee hosts a “Flu Education Day” that includes a luncheon to which all coordinators are invited. Plans for the upcoming influenza vaccination campaign are discussed, new and updated information is shared, and techniques that worked and pitfalls to avoid from the last vaccination campaign are conveyed during breakout sessions. The coordinators administer the vaccinations, and the employee health nurse is responsible for keeping the logs, consents, and declinations. Vaccination acceptance rates have been above 70% for three consecutive influenza seasons.

- Researchers in Atlanta studied 12 area hospitals to gain insight into the relationship between hospital policies and HCP influenza vaccination rates. The three hospitals with the highest vaccination rates (59%, 47%, and 46%) implemented the greatest number of policies that HCP seemed to view as convenient, neutral, or containing positive incentives (for example, the vaccine was provided free of charge, vaccination carts were used on wards and in other locations, vaccination clinics were scheduled). The two hospitals with the lowest vaccination rates (34% and 27%) had implemented the fewest such policies.³⁰
- Researchers in North Carolina studied 268 health care organizations of various types throughout the state, surveying a sample of hospitals, long term care facilities, home health agencies, assisted living facilities, and dialysis centers. They found that only 38% of those surveyed reported having formal written policies pertaining to employee influenza vaccination; 70% of those surveyed reported the existence of written policies, but dialysis centers and assisted living facilities were less likely to have such policies than others (26% and 14%, respectively). Only 2% of the organizations mandated annual HCP vaccinations.¹³

with HCP who wish to decline have seen more dramatic improvement in their vaccination rates than organizations that have passive programs, but even passive declination programs have demonstrated improvement.

Policies

Health care organizations affirm their commitment to improving influenza vaccination rates among their HCP when they create written policy statements.¹² The literature, however, contains little about which policies or combination of policies should be implemented to improve influenza vaccination rates.

Adal et al. recommend work-release policies encouraging HCP to not work until they have recovered from their influenza illness.²³ Gazmararian et al. point out that having a policy does not necessarily mean it has been well implemented and suggest that organizations monitor the influence of policies over time to determine which seem to improve vaccination rates.³⁰ Only a few researchers, including the following, have studied the use of formal written policies on rates of HCP influenza vaccination:

The successful implementation of policies requires adequate resources (both time and money), assigned responsibility for policy implementation, and organizational commitment.⁵²

Focused Responsibility

No matter how large or small, each health care organization should have an individual or a group in charge of the HCP influenza vaccination program in order to be successful over time.¹² Fedson describes the vaccination program for medical residents in the General Medicine Clinic at the University of Virginia Health Services Center. When the responsibility for vaccinating residents during the weekly half-day outpatient clinic sessions was assigned to all nursing staff in 1986, vaccination rates rose from 24% in 1986 to 75% in 1988. In 1989, when this responsibility shifted to one nurse, the rates increased to 93% in 1989, 94% in 1990, and 99% in 1991. The impact on vaccination programs when key personnel are lost became apparent when the rates fell to 82% and 63% in 1992 and 1993, respectively, when this nurse and the clinic director were absent.⁵³

Assigning responsibility for the HCP influenza vaccination program has been used successfully by Cigna Medical Group in Phoenix, Arizona, as described in Text Box 3-10 on page 50.

Incentives

Incentives that have been offered to HCP who have accepted influenza vaccination have included nominal gifts, such as notepads or pens; coupons for coffee or ice cream; drawing for prizes; candy; T-shirts; buttons or stickers that could be placed on name badges indicating that the HCP was vaccinated; and financial incentives such as discounts on benefits, consideration of vaccination status during merit increases, or decisions about granting time off.²⁶ Incentives might help to increase HCP vaccination rates, though their ability to motivate in and of themselves is unclear. Anikeeva et al. suggest that incentives may play a role when coupled with education and minor sanctions.⁵⁴ Various levels of success have been reported with using incentives to increase HCP vaccination rates, as noted by the following researchers:

- Doratotaj et al. compared influenza acceptance rates between HCP who received no interventions beyond the usual influenza campaign and those receiving either a vaccine educational letter, a raffle ticket offering a \$3,000 Caribbean vacation for two, or both. They found no significant difference in vaccination rates ($p = .66$) between those who had received no additional interventions (38% vaccinated), those who received only the letter (39% vaccinated), those who received only the raffle ticket (42% vaccinated), and those who received both (44.5% vaccinated).⁵⁵
- During the 2002–2003 influenza season, Mayo Clinic added an incentive program to its influenza clinics in which HCP could sign up for small gifts such as movie tickets or health books, which were then distributed through a drawing at the conclusion of the vaccination season. Vaccination coverage increased to 56.4% that year, an improvement from the previous year's 42.6%.³²
- Virginia Mason Medical Center in Seattle has held a kickoff tailgate party with the Seattle Seahawks football team each fall since 2005. Virginia Mason staff and Seattle Seahawks who participate in the medical center's tailgate party enjoy food and prizes. The NFL players,

cheerleaders, and mascots help to highlight the importance of the influenza vaccinations by also being vaccinated, along with the medical center staff. Virginia Mason's Beverly Hagar reports that, at the tailgate party in 2008, the organization vaccinated 1,010 HCP in just three hours (Beverly Hagar personal communication, Feb. 9, 2009).

Various vaccination incentives used by other organizations that participated in this Joint Commission project are described in Text Box 3-11 on pages 52–54.

Linking Vaccinations to a Required Activity

Another approach to improving influenza vaccination rates is to provide the vaccination at the same time as another required activity, such as during annual mandatory tuberculin skin testing.⁸ Steiner et al. describe how they gave influenza vaccinations to 62% of their 5,400 HCP during the 1999–2000 influenza season. They gave two-thirds of these vaccinations during one week in October, when the required tuberculosis screenings for all HCP were taking place.⁴¹ Vaccinating HCP might also take place in conjunction with other annual mandatory requirements, such as reviews of various safety and infection control topics.²² Such “one-stop shopping” permits convenient access to the vaccination for HCP and demonstrates a respect for their time. Text Box 3-12 on page 55 gives examples of organizations participating in this project that have offered influenza vaccinations to HCP in conjunction with other required activities.

Mass vaccination strategies can be useful in providing influenza vaccine to large numbers of individuals.⁵⁶ The Infectious Diseases Society of America has stressed the inter-relatedness of seasonal and pandemic influenza responses and has taken the position that each influenza season should be used to test vaccine distribution plans and procedures. Exercising such a vaccination strategy is important in testing issues such as staffing, clinic location and layout, record keeping, communication, and coordination.⁵⁶ Some health care organizations have used pandemic preparedness drills to deliver influenza vaccinations in order to improve influenza vaccination rates while allowing the health care organizations to test their capacity to quickly vaccinate large numbers of HCP as part of their disaster preparedness activities. Kuntz et al. describe how they tested the effect of a six-day pandemic influenza drill on their HCP influenza vaccina-

Text Box 3-11. Organizations Use Incentives

- Albert Einstein Healthcare Network in Philadelphia has tied participation in its HCP influenza vaccination program to the organization's Code of Conduct policy, which is aligned with the patient safety program. Beginning with the 2008–2009 influenza season, all HCP must either accept the vaccine, show proof of having received it elsewhere, or decline the vaccine. Those who do are eligible for an employee bonus payment (if one is offered that year); those who do not are ineligible for a bonus. The organization believes that this has been a factor in increasing HCP vaccination acceptance rates from 33% in 2006–2007 to 59% in 2007–2008 and to 71.1% in 2008–2009; during the 2008–2009 influenza season only 8.4% of the network's HCP either did not receive the vaccine or decline it.
- CentraState Healthcare System in Freehold, New Jersey, began offering the following incentives to HCP beginning with the 2006–2007 campaign:
 - Subsidized immunizations to spouses and adult dependents of HCP
 - Raffles for gift cards during the “early bird special”; the earlier HCP get their vaccinations, the larger the amounts of the gift card they could win
 - A gift card for the “deputy vaccinator” who vaccinates the most HCP
 - An “It's Not Too Late” campaign in January, also offering gift cards as incentives, to reach any unvaccinated HCP

Figure 3-8. CentraState Healthcare System T-shirts



Text Box 3-11 continued from previous page

- Starting with the 2008–2009 campaign, for each vaccinated HCP, a T-shirt with the words, “I got my flu shot. Have you gotten yours?” on the front and “Protect yourself, your patients, your loved ones— you just may save a life . . .” and a “No Flu” logo on the back (see Figure 3-8, page 52).
- A “buddy” drawing for any HCP who brings another for a first influenza vaccination

HCP enjoy these incentives, which have played a part in raising the organization’s vaccination rate from less than 33% prior to 2005 to 50% in 2007–2008 and approximately 55% in 2008–2009.

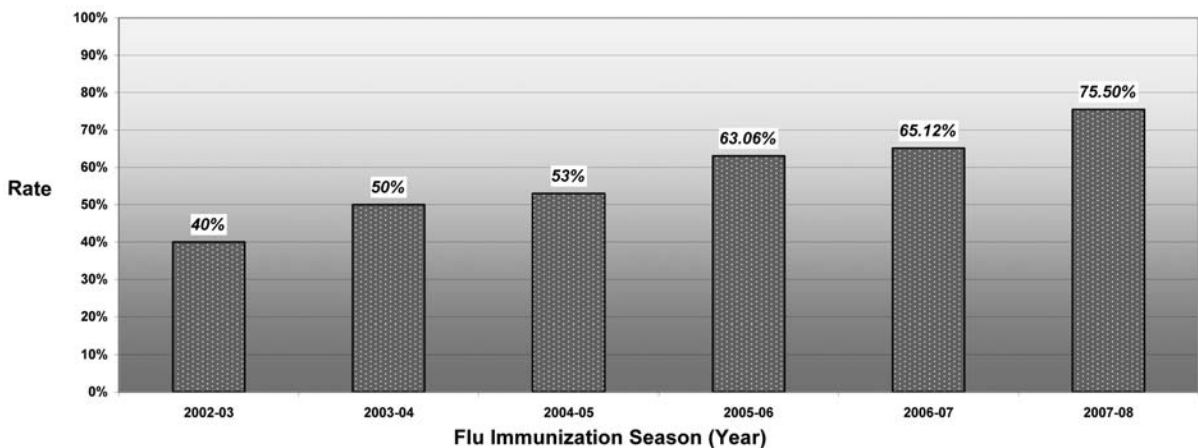
- Community Health Care, Inc., employing more than 200 HCP and headquartered in Davenport, Iowa, is an ambulatory care organization providing medical and dental

care in six locations throughout the Quad Cities area in Davenport, Iowa, and Rock Island and Moline, Illinois. Community Health Care began using the following vaccination incentives during the 2008–2009 influenza season:

- The organization held a campaign slogan contest, with the winner and runner-up receiving gift certificates to local restaurants. The winning slogan, “Coughs and Sneezes Spread Diseases,” was used in educational and marketing materials and informational handouts.
- Staff members were divided into 10 teams; each team that vaccinates 90% of its members can wear jeans to work for two weeks in January.

In 2008 the organization achieved a 94% HCP vaccination rate, up from 65% in 2005–2006, 68% in 2006–2007, and 70% in 2007–2008.

Figure 3-9. Lebanon VA Medical Center Employee Influenza Immunization Participation



2002-03 Flu shots provided at single location - in an Employee health clinic
2003-04 A roving flu shot cart was added to supplement clinic distribution
2004-05 Flu shots given at Quality Festival, however this was the year of vaccine shortage and the staff eligible was limited. The rate reflects percent of those who participated dependent on those eligible.
2005-06 Incentive added, all participants received a "59 minute" time off slip
2006-07 Continued with all previously identified methods
2007-08 Added awarding 4 hour time off slips to 20 randomly drawn participating employees, & gave the department with best participation a pizza lunch.

Continued

Text Box 3-11 continued from previous page

- Lebanon VA Medical Center in Lebanon, Pennsylvania, is a teaching hospital that provides a wide range of patient care services and employs 1,300 HCP. The organization raised its HCP influenza vaccination rate from 53% in 2004–2005 to 63% in 2005–2006, when it gave vaccine recipients a 59-minute time-off slip that HCP could use at their discretion. When a raffle for 20 four-hour time-off slips for vaccinated HCP was added to the incentive package in 2007–2008, the vaccination rate jumped to more than 75%. The organization also awarded the department with the highest participation a pizza lunch (see Figure 3-9, page 53). The department lunch was added to spark healthy competition among departments.
- Spencer Hospital in Spencer, Iowa, has 99 beds and employs 560 HCP. Influenza vaccination was tied to the hospital's group incentive plan, beginning in 2009; to be eligible, HCP must have accepted the vaccination or provided physician documentation of a medical contraindication to the vaccination during the 2008–2009 influenza season. This contributed to improved vaccine acceptance rates, which had been 80% or higher in 2006–2007 and 2007–2008 but increased to 98% in 2008–2009.
- Two organizations vaccinate both HCP and their dependents at no cost:
 - St. John's Regional Medical Center in Joplin, Missouri, a 367-bed facility with 3,000 HCP, has been offering free vaccine (both the trivalent inactivated influenza vaccine and the live, attenuated influenza vaccine) to HCP and dependents since 2004. Vaccination rates prior to 2004 were approximately 40% but have steadily improved to 49% in 2005–2006, 57% in 2006–2007 and 2007–2008, and 60% in 2008–2009. The organization believes that offering the vaccine to family members has boosted HCP acceptance, particularly when HCP see how easy it is for their children to receive the live, attenuated vaccine.
 - St. Joseph's Hospital in Buckhannon, West Virginia, is a 69-bed hospital with 400 HCP. St. Joseph's has provided free influenza vaccinations to HCP and their spouses and dependent children since 2005. The hospital provided 52 vaccinations to HCP families in 2005–2006; the number has increased to 68 in 2008–2009. The HCP influenza vaccination rates have also improved, from 70% in 2005–2006 to between 78% and 85% in the 2006–2009 influenza seasons.
- Upper Chesapeake Health in Bel Air, Maryland, is a community-based, two-hospital system that offers the following incentives to its 2,700 HCP who accept the influenza vaccination:
 - A reduction of \$2 per pay period for health benefits (\$52 per year) beginning in 2006–2007
 - A reward system of stars through which HCP can purchase items from a catalog
 - Eligibility for a random drawing of \$15 gift cards.Since reducing the cost of health benefits by \$2 per pay period, the vaccination acceptance rates have improved from 41% in 2004–2005 and 42% in 2005–2006 to 52% in 2006–2007.
- The Wisconsin Division of Public Health Bureau of Communicable Diseases, headquartered in Madison, Wisconsin, began a statewide program in 2005 to increase vaccination rates among hospital and long term care HCP. The division obtained baseline vaccination rates to determine the extent to which the recommendations of the National Foundation for Infectious Diseases had been incorporated into hospital and long term care influenza vaccination programs, and it established an "80% Club" for organizations that achieved a staff influenza vaccination rate of 80% or higher during the 2005–2006 influenza season. Those that vaccinated at least 80% of HCP had their organization's name published in a newsletter that was distributed to hospital infection preventionists, long term care directors of nursing, and local health department staff statewide. The program has continued in subsequent influenza seasons, with HCP vaccination rates increasing in both the hospitals (mean vaccination rates increased from 58% in 2005–2006 to 67% in 2007–2008) and long term care facilities (mean vaccination rates increased from 50% in 2005–2006 to 65% in 2007–2008).

tion rates at the University of Iowa Hospitals and Clinics in 2005. Using peer vaccinators and mobile vaccination teams in addition to the employee health clinic, they vaccinated 51% of their HCP (6,539 of 12,873), a 10% increase over their 2003 vaccination rate. The authors note, however, that the drill required such extensive resources that they were unable to conduct another drill the following year.⁵⁷

Organizations participating in the Strategies for Implementing Successful Influenza immunization Programs for Health Care Personnel Project that have used this approach to deliver influenza vaccinations to HCP while testing their emergency preparedness are described in Text Box 3-13, pages 56–57.

Mandating Influenza Vaccinations*

Variations on mandatory programs have been described in the literature and described by those who submitted information during the Strategies for Implementing Successful Influenza Immunization Programs for HCP Project’s open call in 2008, including the following three:

1. HCP either receive the vaccination each year or sign a written declination, but no penalties are associated with not signing the form. The following are examples:
 - In a study of a large Georgia health care system, Ribner et al. noted that employees were required to sign a form either consenting to the vaccination, documenting any medical contraindications to it, or declining the vaccination. Each week, supervisors received an updated list of the HCP who had not completed one of the sections of the form, but no formal disciplinary action was identified for failing to participate.⁴⁹
 - Polgreen et al. concluded that declinations without penalties will probably not help to improve HCP influenza vaccination rates.⁴⁴
 - Cleveland Clinic in Cleveland, Ohio, provides HCP with an intranet application to indicate whether they have received or declined the influenza vaccination. Although there are no consequences to an individual

* See Appendix 4-1, pages 73–80, which contains a summary of organizations with position statements, opinions, or requirements regarding HCP influenza vaccinations and to the more detailed discussion in Chapter 2 regarding the moral, ethical, and legal implications of mandatory vaccination programs.

Text Box 3-12. Linking Influenza Vaccinations to Another Mandatory Activity

- CentraState Healthcare System in Freehold, New Jersey, relies on its “vaccine deputies” to give influenza vaccinations during mandatory HCP “Skills Days”—sessions that HCP must attend to demonstrate various competencies. CentraState also provides vaccinations to new HCP at the time of their post-offer physical well into March of each year.
- The Drake Center in Cincinnati is owned by a local hospital network, with centralized employee health services for their 1,000 HCP. Beginning with the 2008–2009 influenza season, it combined its mandatory tuberculin skin testing and influenza vaccination program, offering both during eight two-hour blocks of time over a period of five weeks; as a result, 100% of their HCP received their skin test and were offered influenza vaccinations at the same time. The vaccination acceptance rate increased from 31% in 2007–2008 to 50% in 2008–2009. The organization plans to continue this approach in years to come.

for nonparticipation, the vaccination rate for that person’s unit or division will be lower than others, and this information will be visible to all managers via the intranet’s open dashboard.

2. HCP either receive the vaccination each year or sign a written declination, with penalties or disincentives associated with not signing the form. Text Box 3-14 on page 58 provides examples of organizations participating in this project that have such programs.
3. All HCP receive the vaccine; signed declinations or requests for accommodation are allowed only for HCP who have a medical contraindication or religious objection, and adherence to policy is a condition of employment. The following are some examples:
 - Virginia Mason Medical Center in Seattle was the first hospital in the country to implement a truly mandatory policy for HCP influenza vaccinations.

Text Box 3-13. Mass Vaccination Strategies

■ Franciscan Health System in Tacoma, Washington, is a three-hospital system that increased its HCP influenza vaccination rates by 50% in one year, achieving a 66% vaccine acceptance rate among its 5,500 HCP during the 2007–2008 season, up from 44% the previous year. The Employee Health Department collaborated with the Disaster Preparedness Department in a joint program incorporating mass dispensing of HCP influenza vaccine with a preparedness drill at all three sites, using no additional funds or resources. On the day of the drill, Franciscan set up at least nine vaccination stations at each site, enlisting volunteers to direct flow, answer nonclinical questions, and review consent forms for completeness. Clinical staff giving the immunizations included staff from the pharmacy, nursing students, and additional registered nurse volunteers. Vaccinated HCP passed their paperwork to another volunteer, who placed a sticker on their identification badge to show that they had participated in the drill and had received the vaccination. Franciscan also used “roving teams” of vaccinators to go to high-risk departments such as the operating room or intensive care units and departments where HCP cannot easily leave their work areas to be vaccinated. A sticker on an identification badge quickly revealed HCP who had already been vaccinated. In all, these roving teams accounted for 25% of all the vaccinations given during the drill. The results of this drill were impressive:

- Eight hundred staff, volunteers, and physicians were vaccinated during the four-hour drill at the organization’s largest facility; over the course of the previous year’s entire influenza campaign, a total of 1,790 HCP were vaccinated.
- Two hundred seventy-six HCP received vaccinations in four hours at one of the smaller hospitals, compared with 345 who received the vaccine during the previous year’s influenza campaign.
- Three hundred HCP were vaccinated during the four-hour drill at the remaining hospital, compared with 512 HCP who were immunized during the previous year’s entire campaign.

After the drill, influenza vaccinations continued to be

offered, with employee health staff going to areas where staff had received a low volume of vaccinations during the drill. The organization intends to continue this practice each year. It learned a great deal from this initial exercise, including the following:

- Having everything set up well in advance of the drill is important to ensure that the drill starts on time and that all supplies and human resources are in place.
 - It is important to identify a “just in time” competency assessment tool for the vaccinators.
 - A drill of this nature tests the organization’s ability to obtain supplies quickly, which may become necessary if some items are depleted or are not in place when the drill starts.
- Good Samaritan Hospital Medical Center in West Islip, New York, has used its emergency point-of-distribution drills to deliver influenza vaccinations to its 4,000 HCP each year since the 2005–2006 influenza season. It became evident that timing the drill to coincide with the kickoff of the influenza campaign dramatically increased the initial number of vaccinations; in the 2007 drill, Good Samaritan vaccinated 400 HCP in four hours. It has found that this is not only an efficient and effective way to provide influenza vaccinations to its HCP but that it also permits the organization to test its capabilities for the mass distribution of a product, as would be required in case of a disaster.
- Loyola University Health System in Maywood, Illinois, conducted a mock bird influenza disaster preparedness drill in 2008, seeing an average of 490 HCP and administering 225 influenza vaccinations per hour during the first 8 hours of the 24-hour drill. A total of 2,420 of the 7,700 HCP were vaccinated at 59 vaccination sites, with an additional 2,706 declining or indicating that they had received the vaccine elsewhere. This vaccination drill was so successful that the organization is considering making it an annual event.
- For the past three influenza seasons, Rome Memorial Hospital in Rome, New York, has started its influenza

Text Box 3-13 continued from previous page

campaign with a point-of-distribution drill during which it gives vaccinations to approximately 300 of its 1,100 HCP in one day. It follows up with vaccinations offered at specific times over another three-week period; it also vaccinates HCP who are newly hired during the influenza season. The organization has seen its vaccination acceptance rates steadily increase from 34% in 2005–2006 to above 70% in 2008–2009.

■ Spencer Hospital in Spencer, Iowa, added practicing its pandemic influenza mass vaccination plan to its 2008 influenza campaign, vaccinating more than 85% of its almost 600 HCP in two days. It continues to offer the vaccinations after the drill. This contributed to the organization’s increased vaccination acceptance rate, improving from 88% in 2007–2008 to 98% in 2008–2009.

Requests for accommodation (*not* declinations) based solely on religious grounds or for medical reasons are evaluated on a case-by-case basis. If they are approved, nonvaccinated staff are required to wear a mask during influenza season.⁵⁸ Ultimately, HCP can be terminated under the policy, as were seven in the first year; only two have been terminated in the years since. Beverly Hagar of Virginia Mason Medical Center reports that influenza vaccination rates in 2002–2004, when the program included education and voluntary vaccinations, were 38%, 54%, and 29.5%, respectively; since the mandatory policy’s implementation in 2005, vaccination rates have been at 98%–99.25%. (Beverly Hagar personal communication, Feb. 9, 2009.)

- The U.S. Department of Defense requires all military personnel who provide patient care in the Military Health System to receive influenza vaccinations each year. Only documented medical or religious reasons are accepted for declination. In a memorandum from the assistant secretary of defense in April 2008, the policy was broadened to require, rather than just recommend, the annual vaccination of civilian HCP who provide direct patient care. The policy is expected to be fully implemented by the 2009–2010 influenza season.⁵⁹
- Barnes Jewish Healthcare is a large Midwestern health care organization with acute, long term care, and home care services, employing more than 26,000 HCP. Barnes delivers services to residents primarily in the greater St. Louis, southern Illinois, and mid-Missouri regions. In 2008 Barnes made influenza vaccination a condition of employment, although HCP could request medical or religious exemptions.

Such requests were reviewed on an individual basis, and granted requests were either permanent or temporary (that is, for one year only). HCP who were either not vaccinated or exempted by December 2008 were not scheduled for work; those still not vaccinated or exempted by January 15, 2009, were terminated. Overall results were as follows:

- ▲ Of 25,982 HCP, 25,560 (98.4%) received the influenza vaccine (up from 72% the previous year).
- ▲ Of 25,982 HCP, 321 (1.2%) received medical exemptions.
- ▲ Ninety (0.3%) received religious exemptions.
- ▲ Eleven (0.04%) were not vaccinated or exempted.

The organization found that fewer HCP requested medical or religious exemptions in 2008 than had signed declinations in 2007.⁶⁰

Measuring Influenza Vaccination Rates and Their Impact

As noted in Table 3-1 on pages 30–33, measuring influenza vaccination rates is recognized by The Joint Commission, APIC, CDC, and SHEA and endorsed by NFID as an important component of an organization’s influenza vaccination program. Only through measurement is it possible to determine whether performance is getting better, getting worse, or staying the same.

Organizations that require HCP to either receive the influenza vaccination or sign a declination statement often determine their “rate of participation,” or the percentage of all staff who did one or the other. Although a 100% participation rate may be the policy, the goal should always be to increase the percentage of HCP accepting the vaccination and decrease the percentage declining it.

Text Box 3-14. Mandatory Participation with Penalties

- Albert Einstein Healthcare Network in Philadelphia has incorporated its HCP influenza vaccination program into its Code of Conduct policy, which is aligned with the organization's patient safety program. Beginning with the 2008–2009 influenza season, all HCP must accept the vaccine, show proof of having received it elsewhere, or decline it online. Those who do one of these three are eligible for an employee bonus payment if one is offered that year, while those who do not are ineligible for a bonus. The organization has seen its HCP vaccination acceptance rate increase from 33% in 2006–2007 to 59% in 2007–2008 (the first year in which signed declinations were requested) to 70.5% in 2008–2009 (the first year in which vaccination or declination was mandated).
- Stamford Hospital in Stamford, Connecticut, requires its 2,400 HCP to either accept the influenza vaccination or sign a declination form, a policy that started with the 2008–2009 influenza season. Failure to do so negatively impacts HCP performance reviews. Vaccine acceptance rates, which had been in the low 50% range since 2004–2005, increased to 64.7% in 2008–2009.
- Northbay Healthcare Group in Fairfield, California, has required its almost 2,000 HCP to either receive the influenza vaccine (on site or elsewhere) or sign a declination as a condition of employment. This policy has been in effect since 2006. Two weeks before the mid-November deadline (and again one week before), the management team receives a list of HCP who have not received the vaccine or signed the declination. The vice president receives the list three days before the deadline. HCP not adhering to the policy are taken off the work schedule until they comply. This is the same approach the organization takes with other mandatory requirements, such as the annual tuberculin skin testing requirement. Participation rates (take the vaccine or sign a declination form) have been at the 99% to 100% level since the requirement began, and the vaccination acceptance rates have improved from 57% in the 2005–2006 influenza season to about 70% each year since then.

Before launching a campaign to improve influenza vaccination rates among HCP, it is important to understand the true historical rate of vaccination within an organization. As several authors have pointed out, HCP who have received the vaccination in venues outside the formal organization program, such as in physicians' offices, local pharmacies, and the like, should be captured and included with the number of HCP who received the vaccination within the organization's program. Capturing all HCP who have been vaccinated, regardless of where they were vaccinated, provides a more accurate picture of the number and percentage of HCP who are protected.^{2,28} Bearman et al. found that 34 (64%) of the 53 medical house staff who had not received the vaccination through their organization had received it elsewhere; when the number of house staff vaccinated elsewhere was combined with the number who had received it in their organization, the vaccination acceptance rate rose from 48% to a true rate of 75%.⁶¹

The Healthcare Infection Control Practices Advisory Committee (HICPAC) has recommended using HCP influenza vaccination rates as a measure of quality in states that mandate public reporting of health care–associated infections, a recommendation that has been endorsed by the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC), the Council of State and Territorial Epidemiologists, and the Society for Healthcare Epidemiology of America.⁶² Such publicly reported rates can provide information to help the public gauge organizations' infection prevention programs and can also drive organizations' performance improvement.

Another way to measure and gain insight into how well your organization's influenza vaccination program is working is to routinely conduct surveillance for health care–associated influenza in your patients. This is one of the recommendations in the SHEA 2005 position paper, as prospective surveillance during the influenza season permits recognition of cases that might otherwise go unnoticed unless they are part of a larger outbreak.² You need to decide who will conduct the surveillance and how, what signs or symptoms to use to define *influenza-like illness*, and what laboratory specimens and tests to use to confirm the diagnosis of influenza before influenza season begins. Your decisions are likely to depend on your organization's available resources.² The following are a few of the studies that have examined the use of active surveillance for health care–associated influenza:

- Salgado et al. describe their active hospitalwide surveillance to detect health care–associated influenza in a tertiary care academic hospital in Virginia; surveillance was performed by infection preventionists. They determined that patients admitted three or more days before developing symptoms such as cough and fever with or without myalgia, coryza, or sore throat would meet their definition of possible health care–associated influenza. When they identified patients with these symptoms, they placed them in isolation and ordered diagnostic tests.¹⁴
- Monto et al. report on influenza surveillance among elderly residents of long term care facilities in Michigan from November through April during two influenza seasons. Staff collected throat swab specimens when residents developed a cough and fever of at least 99.5°F (37.5°C). When two or more cases of laboratory-confirmed influenza were identified in a long term care facility in a given five-day period, the staff implemented outbreak control measures. The authors conclude that this type of active surveillance is important to identify influenza activity and manage outbreaks.⁶³
- Adal et al. describe the active surveillance performed by their infection preventionists at a Virginia university hospital. The laboratory reported all positive influenza tests to the infection preventionists, nursing and medical staff reported suspect cases to them, and the infection preventionists actively sought to identify patients during clinical rounds. A case of health care–associated influenza was defined as having onset more than 72 hours after admission, with fever and respiratory symptoms.²³

Some researchers have acknowledged limitations of active surveillance for health care–associated influenza:

- Researchers in the Netherlands studied the symptoms of patients in three tertiary care units during two influenza seasons to determine how useful the symptoms of influenza (such as fever and cough) are in predicting influenza virus infection in their hospitalized patients. They note that scant information is available in the literature to support the combination of symptoms with the greatest value for identifying possible health care–associ-

ated influenza. Up to 50% of patients with influenza do not develop any signs or symptoms yet still shed the virus. The researchers conclude that the positive predictive value of fever, cough, and other symptoms to diagnose health care–associated influenza is low, and many cases will remain unidentified. They suggest that accurate rapid diagnostic tests would be needed for all patients to determine the burden of disease or to prevent or contain outbreaks.⁶⁴

- French researchers reviewed the literature on health care–associated influenza outbreaks and noted that the lack of standardized information makes comparisons between studies difficult. They conclude that using only a clinical definition of influenza, without systematic laboratory diagnostic tests, could underestimate the incidence of influenza in patients who acquire it while hospitalized.⁶⁵
- Call et al. also reviewed the literature for studies pertaining to the diagnosis of influenza based on clinical signs and symptoms. They conclude that, while useful in identifying patients with influenza-like illness, clinical findings alone are not useful for confirming or excluding the diagnosis of influenza.⁶⁶

Feedback to Personnel

The CDC has recommended that organizations “Monitor HCP influenza vaccination coverage and declinations at regular intervals during influenza season and provide feedback of ward-, unit-, and specialty-specific rates to staff and administration.”^{1(p. 2)} The NFID¹² also highlights the role of feedback in improving influenza vaccination rates, noting the important influence of facts and figures on HCP perception of vaccination rates. Other researchers have seen the impact of feedback in improving HCP influenza vaccination rates:

- Salgado et al. cite the use of posted HCP vaccine acceptance rates at the University of Virginia in areas of the hospital frequented by HCP as being partly responsible for increasing vaccination rates to 70%.⁶⁷
- Pottinger et al. studied the impact of feedback to residency program directors or chief residents on influenza vaccination rates of the residents they supervised at the University of Iowa Hospital and Clinics. The vaccination

Text Box 3-15. Providing Feedback

- The Albert Einstein Healthcare Network in Philadelphia uses a Web-based database that tracks HCP vaccinations and declinations, scanning forms to reduce manual input. Managers can view the status of HCP participation within their own departments
- Cleveland Clinic in Cleveland, Ohio, has an intranet application that provides an inexpensive way to capture HCP vaccination information and declinations, with real-time monitoring of vaccination rates by location. The application is linked to the human resource department's database, which creates a daily dashboard that provides feedback to administrators and managers on HCP participation.
- The infection prevention staff at Community Health Care, Inc., in Davenport, Iowa, provides weekly feedback to managers and supervisors by sending them a list of the HCP who have not yet been vaccinated. This allows managers or supervisors to encourage HCP in their departments to get the vaccination.

rate in the group whose supervisors received the feedback was 38%; the vaccination rate in the group whose supervisors received no feedback was only 13%. These researchers suggest that vaccination rates in HCP may improve if HCP are aware that their vaccination status is being monitored.⁶⁸

- Talbot et al. conducted a nationwide survey that included 50 hospitals in 33 states, with a total of 368,696 HCP. They asked the organizations about specific aspects of their HCP influenza programs for the 2007–2008 season and found that reporting HCP vaccination rates to the board of trustees was associated with higher vaccination rates.¹⁸

In addition, providing feedback at regular intervals allows managers and supervisors to encourage HCP they supervise to get vaccinated.

Text Box 3-15, at left, gives some examples of how organizations participating in this project have provided feedback.

Summary

This chapter looks at the elements of a successful influenza vaccination campaign—that is, one that results in increased rates of immunized HCP each year.

Responses from health care organizations as well as a review of the literature reveal that the following elements are key:

- Surveying HCP to learn their reasons for acceptance or declination of the vaccine and using their answers to inform campaign design
- Making vaccination free
- Making vaccination convenient
- Making vaccination available to all HCP
- Having campaigns that are multifaceted
- Having ongoing, active, and visible promotional campaigns
- Offering incentives for vaccination
- Having leaders serve as role models for vaccination
- Offering well-planned educational efforts tailored to HCP
- Advertising vaccine availability in print and electronic media
- Making a group or an individual responsible for the program
- Having HCP sign declination letters, as needed

This chapter also examines strategies to raise the rates of HCP influenza vaccination, including linking vaccinations to a required activity and making vaccinations mandatory. Finally, it is key to measure influenza vaccination rates, as it is only through measurement that one can determine whether performance is getting better, getting worse, or staying the same.

We hope others will use the strategies detailed in this chapter to improve immunization rates among HCP.

Many organizations have taken positions on and issued guidelines for vaccinating HCP against influenza. Their guidelines, legislative and regulatory efforts, position papers, and accreditation considerations are the subject of Chapter 4.

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CHAPTER

4

Guidelines, Legislative/Regulatory Efforts, Position Papers, and Accreditation Considerations

This chapter provides an overview of many of the existing guidelines, legislative and regulatory efforts, position papers, and accreditation efforts related to immunizing health care personnel (HCP) against influenza.

Organizations can use these resources as they implement or seek to improve their influenza immunization programs. Appendix 4-1, pages 73–80, provides an overview of the positions and efforts of a number of organizations regarding immunizing HCP against influenza.*

- In a May 29, 2008, memo, the assistant secretary of health of the U.S. Department of Health and Human Services (HHS) announced a tool kit and related strategies to improve influenza vaccination levels among HCP at the HHS, including fostering partnerships among organizations to achieve this goal. The memo states that

* Web addresses to the Web sites of some organizations are mentioned within this chapter. In addition, Web addresses to the Web sites of all mentioned organizations are listed in Appendix 4-1, pages 73–80. Readers are encouraged to go directly to Appendix 4-1 to see available resources.

HCP must set an example for the patients in their care by being vaccinated and that it is important to reach the Healthy People 2010 goal of vaccinating 60% of HCP. The tool kit provides numerous resources for health care organizations, health care professional schools, professional health associations, and HCP leaders to gain valuable information about influenza and pass it on to their colleagues and employees. The tool kit and the link to the assistant secretary's memo are available at <http://www.hhs.gov/ophs/programs/initiatives/vacctoolkit/index.html>.^{1,2} The tool kit contains the following items:

- Links to multiple Web sites, such as those of the Centers for Disease Control and Prevention (CDC), the National Foundation for Infectious Diseases (NFID), the Food and Drug Administration (FDA), and the American College of Physicians
- A PowerPoint presentation that includes a list of the many partners that the HHS would like to work with in the initiative, as well as an overview of influenza and its impact, the vaccine and its impact,

reasons given by HCPs for accepting or rejecting the vaccine, and strategies for improving HCP vaccination rates

- Relevant reference articles
- Free printable materials, including posters; badges; buttons; vaccine information statements about intranasally administered live, attenuated influenza vaccine (LAIV) and trivalent inactivated influenza vaccine (TIV); patient education materials; and National Influenza Vaccination Week materials
- Common questions and answers about the flu vaccine for HCP regarding influenza and the influenza vaccine
- An overview of the HHS's efforts to increase vaccination rates, including two examples of best practices, with PowerPoint presentations
- The CDC has many resources available regarding influenza immunization, including the following:
 - A Web site dedicated to information regarding seasonal influenza, with links to information for HCP (available at <http://www.cdc.gov/flu/professionals/vaccination/index.htm>)³:
 - ▲ The 2008–2009 Recommendations of the Advisory Committee on Immunization Practices (ACIP) overview
 - ▲ A summary of key points for clinicians
 - ▲ Composition of the vaccine and information on dosages and administration
 - ▲ Supply, distribution, storage, and handling details, with links to the American Lung Association's "Flu Clinic Locator" (available at <http://www.flucliniclocator.org>)⁴ and the CDC's spreadsheets of public health department clinics (available at http://www.cdc.gov/flu/protect/pdf/pub_health_dept_flu_clinics.pdf)⁵
 - ▲ Vaccine effectiveness and safety
 - ▲ Patient education resources
 - ▲ Related resources
 - ▲ Information regarding the current influenza season
- Relevant CDC guidelines on influenza immunization, including the following:
 - ▲ "Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP)." This report is updated annually and is published in *Morbidity and Mortality Weekly Report*. The 2008 recommendations are available at <http://www.cdc.gov/flu/professionals/vaccination/index.htm>⁶
 - ▲ "Influenza Vaccination of Health-Care Personnel: Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the ACIP." The most recent recommendations, published in 2006, are available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm>.⁷ This report's key recommendations for the immunization of HCP against influenza include the following:
 - ▼ Educating HCP on the epidemiology of influenza, the consequences of influenza disease for themselves and their patients, and the benefits of the vaccine
 - ▼ Providing the vaccinations (using either LAIV or TIV) annually at the work site and at no cost, using strategies that have been shown to improve vaccination rates
 - ▼ Obtaining signed declinations from HCP who refuse the vaccination for nonmedical reasons
 - ▼ Monitoring vaccination acceptance and declination rates and providing feedback to HCP and administration on those rates
 - ▼ Using the rates of HCP vaccination as a measure of an organization's patient safety quality program

- Created in 2000, the National Influenza Vaccine Summit’s “Prevent Influenza Now!” Web site is co-sponsored by the CDC and the American Medical Association. It is available at <http://www.preventinfluenza.org>.⁸ The summit has more than 400 members, representing more than 100 public and private organizations, including HCP, public health professionals, vaccine manufacturers and distributors, consumers, and others interested in vaccine-preventable diseases. Focused on resolving influenza vaccine-related issues and improving vaccination rates, the summit meets each year to coordinate communication among all national partners involved in any aspect of influenza vaccine production, distribution, or administration. Their Web site contains a wealth of information for patients and HCP, including links to their newsletters and information about their meetings. Information for HCP includes a summary of the vaccines for the current season (manufacturer, product, formulation, and age indications); the Influenza Vaccine Availability Tracking System (IVATS), which allows HCP to locate influenza vaccine manufacturers that have vaccine available for purchase in the current influenza season; vaccine recommendations (for example, what is new in the current influenza season, who should be given priority for vaccination); vaccination procedures and strategies, including screening questionnaires for the LAIV and TIV formulations and standing orders and vaccine information statements for each; information on late-season influenza vaccination (strategies, tools, and efforts to reach unvaccinated populations); and a list of organizations with position papers related to immunizing HCP against influenza.
- Legislative and regulatory efforts have been successful in increasing HCP compliance with immunization requirements for infectious diseases such as measles, rubella, hepatitis B, varicella, and mumps.^{9,10} In fact, in health care settings mandating hepatitis B and rubella vaccinations, high levels of vaccination of HCP against these diseases has been achieved.¹⁰ In a study conducted by Lindley et al., researchers identified 32 states that had some type of law regarding administration of vaccines to HCP; the vast majority of these laws concerned hepatitis B immunization (20 states).⁹

At the time the information was collected, between September 2004 and June 2005, the researchers found that only 3 states had laws for ensuring HCP influenza immunization and that only 3 states had laws for offering the immunization.⁹ Poland and Jacobson argue that, because 26 years of HCP education on the importance of influenza vaccinations has not resulted in sustained increases in their acceptance of the vaccine, legal requirements for HCP immunization are appropriate to protect HCP and the patients they care for.¹¹ The Infectious Diseases Society of America (IDSA) has called for mandatory influenza immunization of HCP and legislative assistance in implementing such HCP requirements (more information is available at <http://www.idsociety.org/influenza.htm>).¹²

Other resources include the following:

- A searchable database of laws on the immunization of HCP in hospitals and ambulatory care settings, by state, population, and facility type, is available at <http://www2a.cdc.gov/nip/stateVaccApp/StateVaccsApp/default.asp>.¹³
- Information provided by Stewart et al. in 2005 on regulations regarding the vaccination of HCP in long term care facilities for influenza is available at <http://www.gwumc.edu/sphhs/departments/health-policy/immunization/EUSIL-LTC-report.pdf>.¹⁴
- The NFID, whose mission includes educating the public and HCP about infectious diseases, has focused its attention on the issue of influenza vaccination among HCP through the following activities:
 - The NFID convened a roundtable discussion on the subject, leading to its first “Call to Action” on the immunization of HCP against influenza in 2004. That year the NFID published *Improving Influenza Vaccination Rates in Health Care Workers: Strategies to Increase Protection for Workers and Patients*, detailing the impact of influenza among HCP; vaccine effectiveness and its economic benefits; HCP knowledge, attitudes, and behaviors surrounding vaccination; and ways to increase HCP vaccination rates (available at <http://www.nfid.org/pdf/publications/hcwmonograph.pdf>).¹⁶

- A new “Call to Action” was issued in 2007, with a focus on key steps health care institutions can take to ensure that their workers are vaccinated against influenza. The NFID developed materials in this “Call to Action” to serve as a resource for educating HCP about the effects of influenza and the actions they can take to protect themselves, employees, and patients from contracting influenza. The 2007 “Call to Action” and the resulting monograph *Influenza Immunization Among Health Care Personnel* can be accessed at http://www.nfid.org/influenza/professionals_workersflu_cta.html.¹⁷
- On October 20, 2007, the NFID convened a roundtable of experts to discuss ways to increase the rates of influenza immunization among HCP. The roundtable brought together representatives from acute and post-acute care settings as well as health care industries to share insights and best practices. From this roundtable meeting, the NFID developed a report on best practices intended to help health care organizations establish and maintain successful influenza immunization programs for their HCP. The roundtable report, titled *Immunizing Healthcare Personnel Against Influenza: A Report on Best Practices*, presents model influenza immunization programs that can be adapted to any organization. It is available at <http://www.nfid.org/HCWtoolkit/report.html>.¹⁵
- A number of organizations have developed position papers on the vaccination of HCP for influenza (see Appendix 4-1, pages 73–80, for a summary list of examples of organizations with position statements). Two organizations with such position papers are the Society for Healthcare Epidemiology of America (SHEA) and the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC):
 - SHEA published its position paper in 2005 (available at http://www.shea-online.org/Assets/files/position_papers/HCW_Flu_SHEA_Position_Paper.pdf).¹⁸ The paper, “Influenza Vaccination of Healthcare Workers and Vaccine Allocation for Healthcare Workers During Vaccine Shortages,” is a two-part document* summarizing HCP barriers to accepting the vaccine and the organization’s comprehensive influenza recommendations, including the following:
 - Part 1 (“Influenza Vaccination of Healthcare Workers”) recommendations include the following:
 - ▲ Provide annual education targeted to all HCP that includes information about the severity of the disease and the safety of the vaccine.
 - ▲ Provide information about the importance of the vaccination in promoting both HCP and patient safety.
 - ▲ Provide the vaccine at no cost and at convenient locations and times.
 - ▲ Ask HCP to sign declinations if they refuse the vaccine or have medical contraindications to receiving it.
 - ▲ Conduct surveillance for vaccine uptake by unit and identify patients who develop health care–associated influenza to assess the impact of the program.
 - APIC published its first position paper on HCP influenza immunization in 2004.¹⁹ In addition to summarizing the issues surrounding transmission of influenza in health care facilities, the serious implications of institutional outbreaks of the disease, and the economic impact of such outbreaks, the position paper highlights APIC’s recommendations for maximizing HCP influenza immunization, including the following:
 - A written policy should be developed, emphasizing the importance of vaccination among HCP. The policy should be distributed to all HCP.
 - Immunization programs should be implemented annually, with an educational component stressing the importance of the immunization and the safety of the vaccine, minimizing barriers to vaccination by increasing access and reducing the cost of vaccinations.

* Part 2, “Allocation of Influenza Vaccine to Healthcare Workers During a Shortage,” is not discussed in this monograph. The reader is referred to the Web address provided for further information.

- Annual HCP immunization rates should be monitored and feedback provided, while health care–associated influenza rates in patients should be tracked and compared with HCP vaccination rates.
- Restrictions on visitors should be established, if necessary, in response to increasing community incidence of influenza, in cooperation with public health officials and hospital administration.

The APIC 2004 position paper also contains recommendations for facilities to consider to enhance their immunization programs, such as bringing vaccine to employees at convenient times and locations, providing the vaccine at no cost, and educating employees through multiple and diverse means.

- APIC’s 2008 position paper recommends that health care facilities implement a comprehensive strategy that includes all the recommendations for the vaccination of HCP against influenza outlined in the 2006 report of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices (ACIP).⁷ As part of a comprehensive strategy, APIC recommends that all HCP involved in direct patient care be immunized against influenza annually and that HCP who decline the vaccine for nonmedical reasons sign an informed declination, highlighting the risk to patients if they contract influenza from ill HCP. The 2008 APIC Position Paper is available at http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC_Position_Paper_Influenza_11_7_08final_revised.pdf.²⁰ The APIC Web site also provides information about mandatory immunization programs for HCP and a resource kit designed to help infection preventionists develop and implement HCP influenza immunization programs in their institutions. The “Protect Your Patients. Protect Yourself.” program supports APIC’s position, encouraging infection preventionists to help champion influenza immunization among HCP.
- The American Lung Association supports HCP influenza immunization as a key prevention strategy to protect both HCP and the patients they care for from influenza. The organization has a multiyear national public awareness and education initiative called “The Faces of Influenza,” avail-

able at <http://www.facesofinfluenza.org>.²¹ Using the faces of Hollywood actors, well-known athletes, and everyday people who have experienced personal tragedies from influenza, this Web site encourages everyone to see themselves among those who would benefit from vaccination each year. The Web site provides a wealth of information about influenza and the benefits of the vaccine, for both the lay community and HCP. The section of the Web site aimed at HCP contains a “tool kit,” with multiple downloadable resource materials, such as letter and article templates that organizations can customize, an influenza background presentation that can be used for HCP or community groups, brochures, and fact sheets (available at <http://www.facesofinfluenza.org/en/influenza-awareness-tool-kit>).²²

- In 2006, The Joint Commission announced a new infection control standard requiring accredited hospitals, critical access hospitals, and long term care facilities to offer influenza vaccinations to HCP, including licensed independent practitioners and volunteers.²³ The Joint Commission developed the standard in response to recommendations by the CDC making the reduction of influenza transmission from health care professionals to patients a top priority in the United States. The Joint Commission standard, effective July 1, 2007, requires the specified organizations to do the following:
 - Establish an annual influenza vaccination program that includes, at a minimum, staff and licensed independent practitioners.
 - Provide access to influenza vaccinations on site.
 - Educate staff and licensed independent practitioners about flu vaccination, nonvaccine control measures (such as the use of appropriate precautions), and the diagnosis, transmission, and potential impact of influenza.
 - Annually monitor vaccination rates and reasons for nonparticipation in the organization’s immunization program.
 - Implement enhancements to the program to increase participation.

The standard (for hospitals, IC.02.04.01) can be viewed at http://www.jointcommission.org/NR/rdonlyres/38BE6D6D-59D7-4314-9E2B-3C4571F92159/0/HAP_IC.pdf.²⁴

- In September 2008, Joint Commission Resources launched the “Flu Vaccination Challenge,” which continued throughout the 2008–2009 influenza season. The purpose of the challenge was to emphasize the responsibility of all hospital HCP to keep themselves and the patients they care for safe and healthy. More information about the challenge, designed to increase HCP influenza immunization rates, is available at <http://www.fluvaccinationchallenge.com>.²⁵
- The National Quality Forum (NQF), a voluntary consensus health care standard-setting organization, included HCP influenza vaccination as one of the 30 “safe practices” that should be employed universally to reduce the risk of harm to patients (see http://www.qualityforum.org/pdf/reports/safe_practices.pdf). Specifically, the NQF set of safe practices focuses on high-priority practices for which there is strong evidence of effectiveness in reducing the likelihood of patient harm, that can be applied in multiple clinical care settings and/or with multiple types of patients, that are likely to enhance patient safety if fully implemented, and that have practical information available for consumers, purchasers, providers, and researchers. Practice number 26 calls for health care organizations to vaccinate HCP against influenza for their own as well as their patients’ protection.²⁶
- The Infectious Diseases Society of America (IDSA) developed the 2007 document *Pandemic and Seasonal Influenza: Principles for U.S. Action*, which outlines 12 principles with detailed, action-oriented recommendations. The principles stress the interrelatedness of responses between seasonal and pandemic influenza. One of the principles is to “improve seasonal influenza response” by requiring HCP to receive annual influenza vaccinations or decline in writing. It is the IDSA’s position that each influenza season should also be used to test vaccine distribution plans and procedures. This IDSA document is available at <http://www.idsociety.org/WorkArea/showcontent.aspx?id=5728>.²⁷

- Service Employees International Union (SEIU), the largest health care union in North America, strongly encourages its members to receive the influenza vaccine each year and urges employers to provide a comprehensive annual influenza immunization program and make the vaccine available at no charge. The union supports voluntary, not mandatory, influenza immunization programs. More information is available at http://sboh.wa.gov/Meetings/2007/03-14/docs/Tab09c_Imm_SO_PPP.pdf.²⁸
- The U.S. Department of Defense requires all military personnel who provide patient care in the Military Health System to receive influenza vaccinations each year. In a memorandum from the assistant secretary of defense in April 2008, the requirement was broadened to require the annual vaccination of civilian HCP who provide direct patient care (this was previously recommended but not mandatory). More information is available at <http://mhs.osd.mil/Content/docs/pdfs/policies/2008/08-005.pdf>.²⁹

Summary

Many recognized leaders in health care encourage health care organizations to use the resources described in this chapter, via the list of Web addresses provided in Appendix 4-1 (pages 73–80), to inform their influenza immunization program improvement efforts. Although these groups may have differences of opinion on certain aspects of organizational influenza vaccination programs, they all recognize the importance of and support annual influenza vaccination of HCP.

This monograph reviews the issues surrounding the morbidity, mortality, and costs related to health care–associated influenza and why it is so important that HCP be vaccinated against the disease. It also provides an overview of the vaccine’s effectiveness, factors that influence HCP vaccination, the impact of institutional influenza outbreaks, and issues surrounding both voluntary and mandatory vaccinations. Finally, it provides examples of strategies to improve HCP influenza vaccination rates, from health care organizations as well as a review of the literature, which others can use to improve their vaccination rates.

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**Appendix 4-1.
Examples of Professional Health Care Organizations, Agencies, and
Other Entities with Position Statements, Opinions, or Requirements
Regarding Influenza Immunization of Health Care Personnel (HCP)***

Organization Name	Organization Type	Position Overview	For More Information (All Web sites accessed November 2008)
American Association of Physician Assistants (AAPA)	Professional organization	The AAPA strongly recommends that physician assistants be appropriately vaccinated, as recommended by HICPAC/ACIP.†	http://www.preventinfluenza.org/AAPAAonHCW.pdf
American College of Occupational and Environmental Medicine (ACOEM)	Professional organization	The ACOEM endorses a multifaceted influenza control program but discourages policies mandating vaccine or prophylactic medication compliance. ACOEM does not support declination forms. The organization has taken no position on HCP education or tracking of influenza rates among HCP.	http://www.acoem.org/guidelines.aspx?id=730
American College of Physicians (ACP)	Professional organization	The ACP recommends requiring influenza vaccination for all HCP responsible for direct patient care.	http://www.acponline.org/pressroom/hcw.htm
American Hospital Association (AHA)	Professional organization	The AHA supports immunization, vaccination education, and monitoring of influenza vaccination rates for all directly employed staff who receive vaccination through the organization's immunization program. The AHA takes no position regarding the use of declination forms.	http://www.aha.org/aha/letter/2006/060210-cl-immunization.pdf
American Lung Association	Voluntary health organization	The American Lung Association supports influenza immunizations for HCP to protect HCP and their patients from influenza. Their "Faces of Influenza" Web site makes available fact sheets, brochures, and other materials to HCP at no charge, including customizable and downloadable influenza background presentations and templates for letters, articles, press releases, and the like.	http://www.facesofinfluenza.org/en/influenza-hcp/

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* Visit these organizations' Web sites for more information. Although some of these Web addresses appear in Chapter 4 and in that chapter's reference list, this appendix contains a more complete list of organizational Web addresses.

† Pearson M.L., Bridges C.B., Harper S.A.: 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 Recomm Rep 55:1–16, Feb. 24, 2006. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm>.

Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information <small>(All Web sites accessed November 2008)</small>
American Medical Association (AMA)	Professional organization	The AMA encourages all hospitals, health care systems, and health care providers to immunize HCP. The AMA also supports a system for measuring and maximizing the rate of influenza immunization for health care workers in all hospitals and skilled nursing facilities.	http://search.ama-assn.org/Search/ (type in the search term "influenza")
American Nurses Association (ANA)	Professional organization	The ANA supports seasonal influenza education and aggressive vaccination programs for all registered nurses. It also supports the use of declination forms. The ANA takes no position on tracking HCP influenza vaccination rates.	http://preventinfluenzanow.org/ANAonHCW.pdf
American Pharmacists Association (APhA)	Professional organization	The APhA recommends that all pharmacy personnel receive all immunizations the CDC recommends for HCP. The organization takes no position on the use of declination forms, HCP education, or tracking of HCP vaccination rates.	http://www.pharmacist.com/AM/Template.cfm?Section=House_of_Delegates&Template=/CM/ContentDisplay.cfm&ContentID=10544 See also http://www.cdc.gov/vaccines/recs/downloads/rev_stds_adult_AJPM.pdf

Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information (All Web sites accessed November 2008)
American Society of Health-System Pharmacists (ASHP)	Professional organization	The ASHP advocates that hospital and health system HCP receive an annual influenza vaccination, except when the vaccine is contraindicated, when HCP have religious objections, or when HCP sign an informed declination. The ASHP encourages pharmacists to provide education on the safety and benefits of annual influenza vaccination. The organization takes no specific position on tracking HCP vaccination rates.	<p>ASHP immunization policy site: http://www.ashp.org/Import/PRACTICEANDPOLICY/PublicHealthResourceCenters/Influenza/ImmunizationPolicies.aspx</p> <p>Related sites:</p> <p><i>ASHP Guidelines on the Pharmacist's Role in Immunization:</i> http://www.ashp.org/DocLibrary/BestPractices/ASHPGuidelinesPharmacistsRoleinImmunization.aspx</p> <p><i>ASHP Statement on the Pharmacist's Role in Infection Control:</i> http://www.ashp.org/DocLibrary/BestPractices/InfectionControl.aspx</p>
Association for Professionals in Infection Control and Epidemiology, Inc. (APIC)	Professional organization	<p>In its 2004 position paper on HCP influenza immunization, APIC notes the serious implications of institutional outbreaks of the disease and their economic impact. The position paper also highlights the APIC recommendations for maximizing HCP influenza immunization.</p> <p>In its 2008 position paper, APIC recommends that facilities employing HCP implement a strategy incorporating all the HICPAC/APIC[†] recommendations. Furthermore, it recommends that all facilities require annual influenza immunization for HCP with direct patient contact. The organization also recommends that such facilities adopt the use of informed declinations, pointing out the risk to patients if HCP decline the vaccine for nonmedical reasons. APIC further recommends that facilities use the information provided in declinations to develop improvement strategies for the next influenza vaccination season. A free tool kit is available on the APIC Web site.</p>	<p>The 2004 position paper reference: Dash G.P., et al.: APIC position paper: Improving health care worker influenza immunization rates. <i>Am J Infect Control</i> 32:123–125, May 2004.</p> <p>The 2008 position paper is available at http://www.apic.org/Content/NavigationMenu/PracticeGuidance/Topics/Influenza/APIC_Position_Paper_Influenza_11_7_08final_revised.pdf</p>

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Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information <small>(All Web sites accessed November 2008)</small>
Association of periOperative Registered Nurses (AORN)	Professional organization	The AORN supports mandatory education and mandatory vaccination for HCP. The organization takes no position on the use of declination forms or tracking of HCP vaccination rates.	<p>AORN guidance statement: Human and avian influenza and severe acute respiratory syndrome. <i>AORN J</i> 84:284–298, Aug. 2006.</p> <p>Available at http://www.aorn.org/docs_assets/55B250E0-9779-5C0D-1DDC8177C9B4C8EB/A32A54E8-17A4-49A8-867E5E2E063925FF/AGS_Human_and_Avian_Influenza_and_Severe_Acute_Respiratory_Syndrome.pdf</p>
Canadian Government, Province of Ontario	Government agency	The Province of Ontario recommends annual influenza vaccination for all HCP in facilities and community settings who are capable of transmitting influenza disease to those at risk. The province takes no position on declination forms. Employers must provide education and training on the hierarchy of controls used to reduce the spread of influenza and to document the workers trained, dates of training, and materials covered. Employers are obligated to take reasonable steps to protect workers in the workplace. Health care–associated infections among HCP are occupational illnesses that must be reported.	<p>Ontario Web site information: http://www.gettheflushot.ca/providers/commun_doc/tool_flu_shot.pdf</p> <p>Canada Web site information: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/08vol34/acs-3/index-eng.php</p>

Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information <small>(All Web sites accessed November 2008)</small>
Centers for Disease Control and Prevention (CDC): Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practice Advisory Committee (HICPAC)	Government agency/public health	<p>The CDC recommends annual influenza immunization of all HCP that includes the following:</p> <ul style="list-style-type: none"> ■ Educating HCP about influenza and the vaccine ■ Providing the vaccinations at the work site and at no cost, using strategies that have been shown to improve vaccination rates ■ Obtaining signed declinations from HCP who decline the vaccination for nonmedical reasons ■ Monitoring vaccination acceptance and declination rates and providing feedback to HCP and administration on those rates ■ Using the rates of HCP vaccination as a measure of an organization's patient safety quality program. 	<p>http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5502a1.htm. (also see http://www.cdc.gov/flu)</p>
Department of Health and Human Services (HHS)	Government agency/public health	<p>HHS recommends annual influenza vaccination of HCP, as described by HICPAC/ACIP,[†] with a goal of achieving the Healthy People 2010 target of 60% HCP immunization. In 2008 HHS launched an interagency task force to discuss current activities related to the promotion and provision of influenza vaccinations to HCP and has developed a tool kit and related strategies to improve influenza vaccination levels among HCP. HHS has stated that it is imperative for HCP to set an example for the patients in their care by being vaccinated.</p>	<p>http://www.hhs.gov/ophs/programs/initiatives/vacctoolkit/index.html</p>

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Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information <small>(All Web sites accessed November 2008)</small>
Infectious Diseases Society of America (IDSA)	Professional organization	The IDSA encourages annual influenza immunization for HCP who have patient contact. In 2007 the IDSA developed the document <i>Pandemic and Seasonal Influenza, Principles for U.S. Action</i> , which outlines 12 principles, with detailed, action-oriented recommendations. The principles stress the interrelatedness of responses between seasonal and pandemic influenza. One of the principles is to “improve seasonal influenza response” by requiring HCP to receive annual influenza vaccinations or decline in writing. It is the IDSA’s position that each influenza season should be used to test vaccine distribution plans and procedures.	The main influenza Web site and the 2007 document are available at http://www.idsociety.org/influenza.htm
The Joint Commission	Accrediting organization	A new infection control standard became effective July 1, 2007, requiring accredited hospitals, critical access hospitals, and long term care facilities to offer influenza vaccination to HCP, including licensed independent practitioners and volunteers.	http://www.jointcommission.org/NR/rdonlyres/38BEBD6D-59D7-4314-9E2B-3C4571F92159/0/HAP_IC.pdf
National Foundation for Infectious Diseases (NFID)	Charitable foundation	An educational foundation that endorses the recommendations of other groups and organizations, the NFID has focused its attention on the issue of HCP influenza vaccination in several publications. Its 2004 “Call to Action” on HCP influenza vaccination resulted in the publication <i>Improving Influenza Vaccination Rates in Health Care Workers: Strategies to Increase Protection for Workers and Patients</i> . Its second “Call to Action,” in 2007, focused on key steps needed to encourage HCP vaccination, with the publication of the monograph <i>Influenza Immunization Among Health Care Personnel</i> . A 2007 roundtable meeting resulted in a report of best practices that can serve as an organizational model for influenza immunization programs.	The 2004 publication is available at http://www.nfid.org/pdf/publications/hcwmonograph.pdf The 2007 publication is available at http://www.nfid.org/influenza/professionals_workersflu_cta.html The 2008 toolkit is available at http://www.nfid.org/HCWtoolkit/report.html

Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information (All Web sites accessed November 2008)
National Influenza Vaccine Summit (cosponsors AMA and CDC)	Coalition of organizations	The National Influenza Vaccine Summit's Web site, "Prevent Influenza Now!" promotes influenza vaccination for HCP, with a wealth of information on influenza, including vaccination procedures and strategies.	http://www.preventinfluenza.org
National Quality Forum (NQF)	Membership organization	The NQF included HCP influenza vaccination as one of the 30 "safe practices" that should be employed universally to reduce the risk of harm to patients. Practice number 26 calls for health care organizations to vaccinate HCP against influenza to protect HCP and patients from becoming infected with influenza.	http://www.qualityforum.org/pdf/reports/safe_practices.pdf
Occupational Safety and Health Administration (OSHA)	Government agency	OSHA advises health care facilities to encourage and/or provide yearly seasonal influenza vaccination for their staff, including volunteers, during the months of October and November. OSHA has a Pandemic Influenza Plan that includes a system of documentation of vaccination and vaccine stockpiling. OSHA recommends antiviral medication. OSHA takes no position on the use of declination forms, HCP education, or tracking of vaccination rates.	OSHA Pandemic Influenza Preparedness and Response Guidance for Healthcare Workers and Healthcare Employers: http://www.osha.gov/Publications/OSHA_pandemic_health.pdf
Partnership for Prevention	Coalition of organizations	Partnership for Prevention recommends influenza vaccination for HCP of any age. The organization recommends that facilities be required to document that vaccines were offered and either administered or not administered. It supports education and improved surveillance to document the burden of vaccine-preventable disease and immunization rates.	http://www.prevent.org/images/stories/calltoaction.pdf

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Appendix 4-1. Continued

Organization Name	Organization Type	Position Overview	For More Information <small>(All Web sites accessed November 2008)</small>
Public Health Agency of Canada: National Advisory Committee on Immunization (NACI)	Government agency/public health	The NACI recommends that annual influenza vaccination be given to HCP and other care providers in facilities and community settings who are capable of transmitting influenza to those at high risk of complications from influenza. They take no position on declination forms but note that in the absence of contraindications, refusal to be immunized against influenza by HCP who have direct patient contact implies failure in their duty of care to patients. The Public Health Agency of Canada coordinates surveillance through the Centre for Immunization and Respiratory Infectious Disease and collects national data and information through the FluWatch program.	Canada Web site information: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/08vol34/acs-3/index-eng.php
Service Employees International Union (SEIU)	Union	The union strongly encourages its members to be vaccinated each year and encourages employers to make the vaccine available at no charge and provide a comprehensive annual influenza immunization program. The union supports voluntary rather than mandatory influenza immunization programs.	http://sboh.wa.gov/Meetings/2007/03-14/docs/Tab09c_Imm_SO_PPP.pdf
Society for Healthcare Epidemiology of America (SHEA)	Professional organization	SHEA recommends annual influenza immunization of all HCP unless there is a contraindication to the vaccine or HCP actively decline the vaccine. The organization published a position paper on this topic in 2005.	http://www.shea-online.org/Assets/files/position_papers/HCW_Flu_SHEA_Position_Paper.pdf

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Providing a Safer Environment for Health Care Personnel and Patients Through Influenza Vaccination: Strategies from Research and Practice

Transmission of influenza in health care settings is a major concern because health care personnel who have acquired influenza can easily spread the infection to the patients in their care. Influenza vaccination is the most effective way to prevent influenza and its complications. Yet the CDC estimates that only about 40% of health care personnel in the United States are vaccinated against influenza annually.

This monograph highlights vaccination strategies health care organizations can use to improve influenza vaccination rates in health care personnel. The primary sources of content for this monograph include examples of strategies submitted through the Strategies for Implementing Successful Influenza Immunization Programs for Health Care Personnel Project, evidence-based guidelines, published research studies, legislative and regulatory efforts, and accreditation considerations. Individual chapters address the following:

- Vaccine administration considerations
- Issues surrounding influenza vaccination of health care personnel, such as reasons for accepting or declining influenza vaccination, the impact of institutional influenza outbreaks, and the issue of mandatory versus voluntary influenza vaccination
- Strategies for improving health care personnel vaccination rates and factors that influence successful efforts

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