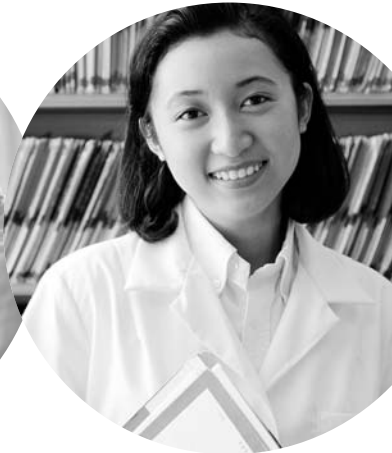


Improving *Influenza* Vaccination Rates in Health Care Workers

Strategies to Increase Protection
for Workers and Patients



**National
Foundation for
Infectious
Diseases**

RESEARCH PREVENTION EDUCATION

Made possible by an unrestricted educational grant to the National Foundation for Infectious Diseases from Aventis Pasteur.

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About the National Foundation for Infectious Diseases

The National Foundation for Infectious Diseases (NFID) is a non-profit tax-exempt 501(c)(3) organization founded in 1973 and dedicated to encouraging and sponsoring public and professional education about infectious diseases; supporting research and training in infectious diseases; and aiding in the prevention and treatment of infectious diseases.

NFID carries out its mission by educating the public; educating health care providers; supporting research and training in infectious diseases; building coalitions; and honoring scientific and public health achievement, legislative contributions, and philanthropy in infectious diseases.



Program Faculty and Editorial Review Board

This publication was developed based on proceedings of a roundtable convened on November 10, 2003, by the National Foundation for Infectious Diseases in Washington, D.C. on the issue of improving influenza vaccination rates in health care workers.

Editorial Review Board

The editorial review board is comprised of members of the roundtable faculty who presented data and led discussions throughout the roundtable. This group has reviewed and approved this document.

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The following groups participated in the roundtable discussion held by NFID and agree annual influenza vaccination among health care workers is an important goal for improved public health and safety. While not directly responsible for reviewing this document, this group provided invaluable comments and insight throughout the daylong program in Washington, D.C., that may be reflected herein.

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Introduction

The Centers for Disease Control and Prevention (CDC) has long recommended annual influenza vaccination for all health care workers.*^{1,2,3} Other infection control and major medical and nursing groups have supported this recommendation. The National Quality Forum, a voluntary consensus health care standard-setting organization, included influenza vaccination of health care workers as one of its 30 safe practices that should be utilized universally to reduce the risk of harm to patients.⁴ Data from the National Health Interview Survey (NHIS) show only 36 percent of health care workers are actually immunized against influenza each year (Figure 1).¹ The National Foundation for Infectious Diseases (NFID) convened a panel of experts on November 10, 2003, to discuss strategies to increase influenza vaccination rates among health care workers.

Health care workers infected with influenza can transmit the highly contagious virus to patients in their care. This is particularly troubling for the many patients at high risk for influenza-related complications, leading to serious morbidity and mortality.

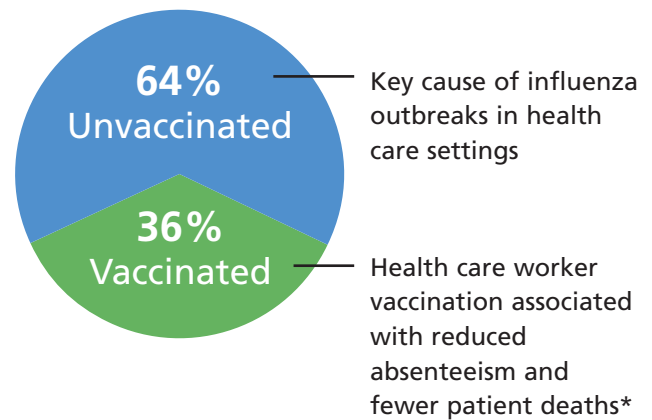
The medical literature suggests health care workers can be a key cause of outbreaks in a variety of health care settings. These employees encounter high-risk patients throughout the influenza season in medical practices, general hospitals, specialty hospitals, long-term care and rehabilitation facilities, home-care sites and other health care settings.

There is broad recognition of the seriousness of this issue among government agencies, health care-related professional organizations

* In the context of this document, the term “health care worker” extends to any employee in a health care setting who comes into contact with patients. This includes physicians, nurses, physician assistants, students of the health care professions and other personnel in hospital and outpatient settings, including medical emergency response workers, nursing home and chronic care facility employees who have contact with residents, employees of assisted living and other residences for persons in high-risk groups and persons who provide home health care.

Figure 1:

Average Annual Influenza Vaccination Rates in Health Care Workers



* Source: CDC. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*. 2003;52 (RR8):1-34.

and a wide range of health care facilities. All agree institutions must work aggressively to increase influenza vaccination rates among health care workers.

While many health care organizations conduct influenza immunization programs, the impact of these programs on immunization rates has not been optimal. A comprehensive, concerted effort is needed by health care institutions, employers, insurers and allied professional organizations to improve health care worker influenza vaccination rates to optimal levels.

What's Needed

Measures should be taken to ensure health care workers are provided convenient access to influenza vaccine. Employers of health care workers need to commit resources toward institutionalizing immunization in the workplace. They need to demonstrate that immunization is a patient and employee safety priority.

Professional health care organizations must develop policies to support health care worker influenza immunization and encourage constituents to educate health care workers about the benefits and safety of vaccination and the potential adverse health consequences of influenza illness to themselves, their patients and their high-risk family members.

A variety of approaches can help increase vaccination rates and lessen the burden of influenza illness among health care providers. Institutions must break down vaccination barriers to increase health care worker immunization rates.

Keys to Increasing Health Care Worker Vaccination Rates

1. Make vaccination convenient
2. Remove cost barriers
3. Educate health care workers
 - Injectable influenza vaccine cannot cause influenza
 - Influenza virus is easily transmitted between health care workers and patients, putting already ill patients at risk for influenza illness and its complications
 - CDC recommends annual vaccination for every health care worker
 - There are myths and misconceptions about the influenza virus
4. Top management and administration must become strong advocates to ensure health care workers get vaccinated to achieve better infection control, reduced absenteeism and cost savings or cost effectiveness

Influenza Virus Transmission

Influenza is a highly contagious viral disease that is spread very efficiently from person-to-person, primarily by coughing and sneezing.^{1,5} Influenza can spread rapidly, especially in classrooms, boarding schools, households, offices, medical settings, cruise ships, nursing homes, prisons and other semi-closed or closed populations.⁶

The spectrum of signs and symptoms of influenza is extremely broad, ranging from asymptomatic infections to severe illness and death. Typical influenza is characterized by an abrupt onset of fever, chills, muscle aches, headache, anorexia, dizziness and a sense of fatigue. Cough, sore throat and runny nose are also typical symptoms.¹

An individual generally is infectious about one day before and five days after symptom onset. Approximately 30 to 50 percent of infected persons may remain asymptomatic, but they can still transmit the virus to others. This underscores the fact that prevention of infection, which is best accomplished through widespread immunization, is the optimal means of avoiding nosocomial influenza spread.¹

When influenza affects patients, disease can be severe. An increase in mortality generally accompanies influenza epidemics; this increased mortality results not only from respiratory illness including pneumonia, but also from exacerbation of preexisting conditions such as heart, lung and kidney diseases, and bacterial superinfections.¹

Impact of Influenza Among Health Care Workers

Health care workers are frequently implicated as the source of influenza in health care settings. One reason health care workers transmit influenza is that they often continue to work while infected with the virus.⁷ Another reason is suboptimal adherence to infection control practices, such as isolation recommendations (droplet precautions) and hand hygiene.* CDC clearly states, however, that the single best way to reduce influenza transmission in health care settings is through increased use of influenza vaccine.¹

There are many benefits of health care worker vaccination, including decreased illness leading to reduced absenteeism, reduced medical visits and reduced antibiotic use among health care workers themselves. But the benefits to patients are likely even greater. Health care worker immunization may reduce the risk of outbreaks in all types of health care facilities and has specifically been shown to significantly reduce morbidity (43 percent reduction in influenza-like illness) and mortality (44 percent reduction) among geriatric patients in long-term care facilities.^{1,8}

Keeping staff healthy and working has a direct impact on patient safety in other ways, too.⁹ Replacement workers may be associated with greater cost more than just additional salary; studies show using pool staff in place of experienced unit staff increases adverse events in patients.^{10,11} Absenteeism may also force staff to work double shifts; the

quality of care provided by nurses working 12-hour shifts has been shown to be significantly lower than care given by nurses working 8-hour shifts.¹²

Influenza vaccination is currently viewed as a public health initiative focused on personal choice of employees. However, a shift in the focus of immunization strategy is appropriate—health care worker vaccination is an employee and patient health and safety initiative. Improving patient safety also improves employee well being; conversely, improving employee safety and working conditions has a positive impact on patient safety. In addition, by getting vaccinated health care workers are decreasing the risk of acquiring influenza infection at work and subsequently exposing their families at home.

Impact of Institutional Influenza Outbreaks

Institutional influenza outbreaks can have serious implications—patients are at risk of contracting influenza; staff shortages can result or be exacerbated; admissions may be curtailed; and increased costs may be incurred. Published studies clearly demonstrate these outcomes.^{9,13,14,15,16,17}

In 1957, the Asian influenza pandemic reached the Oklahoma City Veterans' Hospital and infected 39 percent of patients on the neurology ward; all but one of the physicians on the ward was incapacitated.¹⁸ In a Winnipeg hospital, the strain caused a 70 percent increase in absenteeism during a two-week period and cost approximately \$24,500 in excess sick leave (expressed in 1980 Canadian dollars).¹⁹ At New York Hospital in New York City, 62 percent of unvaccinated staff contracted influenza.²⁰

“The single best way to reduce influenza transmission in health care settings is through increased use of influenza vaccine.”

“Health care worker vaccination is an employee and patient health and safety initiative.”

* Detailed information on respiratory hygiene and cough etiquette in health care settings can be found on the CDC Web site at <http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm>.

Even in nonpandemic seasons, which are far more common (just three true pandemics occurred in the last century, in 1918, 1957 and 1968), institutional outbreaks have been well documented.

One very large outbreak occurred during the 1991-1992 influenza season in a New York nursing home (Table 1).¹³ Sixty-five residents (19 percent) contracted influenza; 34 developed influenza-related pneumonia, 19 were hospitalized and two died. Only 10 percent of health care workers in the facility had been vaccinated prior to the outbreak. While the index case in this outbreak was not determined, there is no doubt that unvaccinated health care workers can either introduce influenza into a facility or propagate an outbreak.

Pediatric outbreaks in neonatal intensive care units (NICU), transplant units and pediatric wards have also been documented and summarized.²¹ Children with community-acquired influenza infection, visitors and health care workers were documented sources of these outbreaks. In the 1997-1998 influenza season, influenza virus was isolated in two of four acutely ill babies in a NICU.¹⁴ Because there was documented resistance to amantadine,

an inexpensive antiviral drug that can be used as prophylaxis against influenza spread, oseltamivir and other newer agents were used to abate the outbreak, greatly increasing costs.

An outbreak in Ontario, Canada, in 2000 included 19 infants in a tertiary care referral NICU, resulting in one death.¹⁵ In this facility, just 15 percent of staff had been immunized. Although investigators were unable to pinpoint the source of the outbreak, a health care worker is suspected because no influenza-like illness was found in the mothers of these young children. In this case, the facility was able to abate the outbreak with infection control measures and amantadine prophylaxis.

A report in 2001 documented four influenza cases over four days in a 12-bed, single-room transplant unit.¹⁶ Three of the four infected patients had no visitors between admission and influenza infection to account for the spread, leading investigators to conclude health care workers were the likely source of transmission. Three nurses among the 27 health care workers in the unit also developed influenza.

In 1999, an internal medicine ward in a French hospital had an influenza outbreak in which 41 percent of patients and 23 percent of staff were infected.¹⁷ Influenza vaccination rates were only 43 percent in patients and 38 percent in staff (approximately the average vaccination rate reported in U.S. health care workers). As a result of this outbreak, staff members took 14 person-days of sick leave; eight scheduled admissions had to be postponed; and all emergency admissions to the ward were suspended for 11 days. The average additional cost per patient was \$3,700, and the overall cost in patient-related issues was \$34,000. A small

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Table 1:

Impact of Influenza Outbreak in a Nursing Home

65 of 342 residents infected with influenza A

Effect on Resident	Number/Percentage of Residents with Influenza
Developed influenza pneumonia	34 (52)
Hospitalized	19 (29)
Died	2 (3)

NOTE: 10 percent of health care workers in the facility had been vaccinated. Source: CDC. *MMWR*. 1992;(18):129-31.

outbreak in one ward can be very expensive compared to the cost of immunizing health care workers and can have major implications in light of current staffing shortages.

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Influenza Vaccination: Effectiveness and Economic Benefits

Influenza vaccine effectiveness depends on the age and immune status of the individual being vaccinated and on the match between the strains included in the vaccine and those circulating in the community (Table 2).¹ The vaccine is 70 to 90 percent effective in preventing influenza infection in healthy individuals under 65 years of age. The majority of health care workers are part of this group.

Table 2:

Influenza Vaccine Effectiveness

Age (Years)	Status	Effectiveness*
< 65	Healthy	70-90% against infection
≥ 65	Community-dwelling	30-70% against hospitalization
≥ 65	Nursing home or long-term care resident	30-40% against infection, 50-60% against hospitalization, 80% against death

* Effectiveness changes based on age and immune status of recipient as well as the vaccine match with the circulating influenza strain in any given year.

Source: CDC. *MMWR*. 2003; 52(RR-8):1-34.¹

Table 3:

Cost Analysis of Influenza Vaccination in Healthy Working Adults

	Season/Year	Study Type	Findings
<i>Trial Based</i>			
Nichol ²⁶	1994–1995	CBA	Cost saving
Bridges ²²	1997–1998 1998–1999	CBA	Net costs
Nichol ²⁸	1997-1998	CBA	Break even \$43
<i>Model Based</i>			
Riddiough ²⁹	1983	CUA	Cost effective
Meltzer ²⁴	1999	CBA	Net savings
Nichol ²⁷	2001	CBA	Cost saving
Muennig ²⁵	2001	CEA/CUA	Cost saving
Lee ²³	2002	CBA	Cost saving

CBA=cost-benefit analysis; CUA=cost-utility analysis; CEA=cost-effectiveness analysis

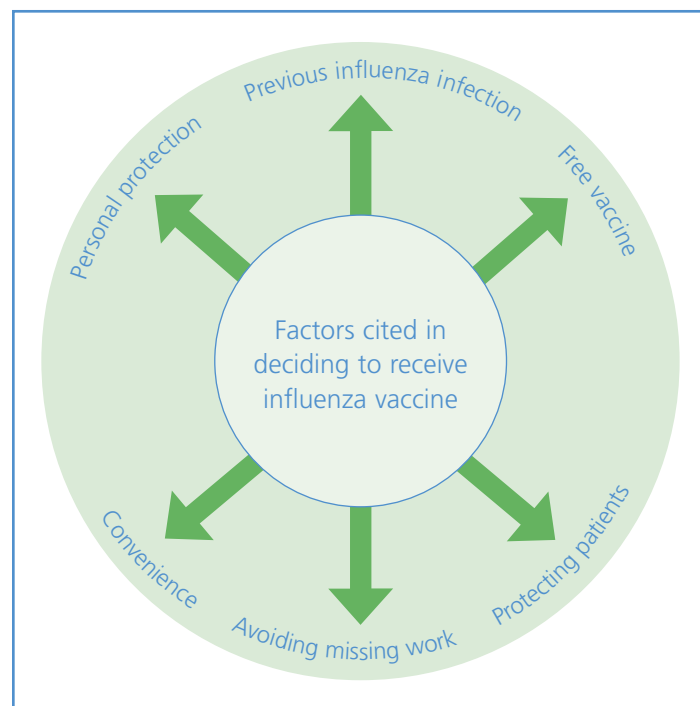
Many U.S. studies have examined the issue of cost effectiveness or cost benefit of influenza vaccination in healthy working adults.^{22,23,24,25,26,27,28,29} Three studies applied economic analysis in a clinical trial context, and five presented economic analysis from a computer-based model using data from published literature rather than from a specific clinical study (Table 3). In most cases, vaccination has been found to be highly cost effective and, in fact, cost saving. One study reported those who received influenza vaccine had 25 percent fewer episodes of respiratory illness, 43 percent fewer days of sick leave from work due to respiratory illness and 44 percent fewer visits to physicians’ offices for upper respiratory illness than those who received placebo.²⁶

Health Care Worker Knowledge, Attitudes and Vaccination Behavior

Examining health care worker knowledge, attitudes and behavior regarding influenza vaccination provides insight into the barriers faced when implementing influenza prevention programs targeting this group. Understanding these barriers is the first step to developing effective strategies to overcome them.

Several studies have assessed influenza vaccination efforts in health care workers in a variety of settings. Reported vaccination rates in the studies ranged from 2.1 percent to 62 percent.^{7,30,31,32,33} This range included an institution with no program to promote influenza vaccination and two institutions with highly developed and widely implemented influenza immunization programs.

One of the earliest studies showed a high proportion of health care workers develop influenza-like illness, and most of them continue to work while ill, undoubtedly shedding virus and exposing colleagues and patients.⁷ Reasons cited by health care workers for continuing to work included the need to perform important tasks, a sense of irreplaceability, a desire not to impose their work on colleagues and not being sick enough to stay home. Preserving sick leave was an issue, particularly for nurses.



One study showed prior vaccination, physician (versus nurse), full-time status and older age were positively associated with influenza immunization.³² Another study included a multi-variant analysis that revealed previous influenza vaccination was the single strongest predictor of subsequent vaccination behavior.³⁰

Reasons cited for not receiving influenza vaccine were strikingly similar across studies.

- Concern about side effects or vaccine safety, including the misperception that the injectable vaccine could cause the flu
- Perception of a low personal risk of contracting influenza
- Inconvenience
- Ignorance of the CDC recommendations
- Dislike of needles

Strategies to Increase Health Care Worker Influenza Vaccination Rates

The three main intervention areas that must be addressed to increase vaccination rates in health care workers are increasing demand, enhancing access and reducing provider barriers.³⁴ To afford optimal protection for patients, CDC recommends health care workers be vaccinated annually starting in October.*¹ While this is optimal, health care worker vaccination should continue into January and beyond, as the influenza season generally peaks between December and March.

Data on influenza vaccination and health care worker knowledge, attitudes and vaccination behavior reveal health care workers need to be educated about the risk of influenza, the safety and benefits of vaccination and the rationale for the CDC immunization recommendations. Second, they need access to an immunization program that makes vaccination convenient and low cost or free of charge for health care workers.

“Health care organizations must also recognize the role of health care worker vaccination as an important infection control and patient safety issue.”

Beyond changing individual health care workers' attitudes, health care organizations must also recognize the role of health care worker vaccination as an important infection control and patient safety issue if they are to achieve high vaccination rates. Influenza vaccination may also deliver financial advantages to the institution by preserving health care capacity. Further, influenza vaccination programs do not have to be complicated to be effective.

Case Study: Pediatric Prevention Network Survey

The Pediatric Prevention Network (PPN) is a cooperative initiative created by the National Association of Children's Hospitals and Related Institutions (NACHRI) and the CDC.³⁵ PPN recognizes the risk posed by unvaccinated health care workers in pediatric environments. In 2000, PPN began a campaign to increase health care worker influenza immunization rates in pediatric institutions.

With a goal of attaining vaccination rates of at least 50 percent, PPN distributed a set of standardized educational materials, including posters, information cards and a set of PowerPoint slides to all network members. A letter describing the goal and soliciting their support was sent to administrators at participating hospitals.

A point prevalence survey of 1,123 health care workers in NICUs, pediatric intensive care units (PICUs) and oncology units in 15 children's hospitals found an overall influenza immunization rate of 53 percent (range, 17 to 87 percent), with rates greater than 50 percent in 8 (53 percent) of 15 hospitals and 100 percent in one PICU and one oncology unit. Reasons health care workers accepted or refused vaccination varied by worksite. The desire to protect patients was cited as a reason for acceptance in 93 percent of vaccinated health care workers in the oncology units, 81 percent in NICUs and 77 percent in PICUs. The use of fact cards and availability of mobile carts were associated with higher rates of vaccine acceptance.

* There are two types of influenza vaccine available; trivalent inactivated vaccine (TIV) and live attenuated influenza vaccine (LAIV). For more information on use, please refer to the CDC's Advisory Committee on Immunization Practice's recommendations published annually in MMWR Recommendations and Reports.

In a multiarm clinical trial, investigators tested a number of interventions designed to increase health care worker influenza vaccination rates: educational memoranda, personalized letters, telephone calls and offering vaccines directly at conferences and clinics, which was most effective.³⁶ The other interventions added to the increase in rates, but investigators concluded making vaccination convenient was the single most effective strategy.

Facilities that successfully vaccinate large portions of health care workers tend to have programs that included multiple interventions. No single strategy is sufficient (Table 4).

Table 4:

Strategies to Increase Vaccination Rates in Health Care Workers

- Select a leader to administer the influenza immunization program
- Get a commitment from top management
- Create a policy statement affirming institutional commitment to increasing health care worker influenza vaccination rates
- Use every possible means to deliver messages
- Provide education and reeducation
- Make influenza vaccine easily accessible
- Remove cost barriers to immunization
- Audit immunization programs and provide feedback to key personnel
- Repeat the influenza immunization program annually

Strategy: Select a leader to administer the influenza immunization program

Some institutions have an influenza program chairperson responsible for planning and administering the influenza vaccination program for workers. More often, it is a department, such as occupational

health or infection control, or a multidisciplinary team that heads up vaccination efforts. Regardless of the size of the health care institution, someone or some group must be in charge of a program to ensure its success and longevity.

At the Detroit Medical Center, an immunization team meets monthly throughout the year. The group, which includes occupational health department members, physicians, nurses, administrators and pharmacists, begins planning strategies for the following year's influenza program as soon as the current year's program ends. Once the new process begins, the group immediately evaluates its efforts and asks: What's working? What's not? What can we do to improve this program even now, while it's running?

Brigham and Women's Hospital in Boston has documented the monthly tasks necessary to implement the highly successful Employee Influenza Program (See sidebar page 18). The planning committee meets regularly throughout the year to make decisions about all elements of the program.

Strategy: Get a commitment from top management

Top management commitment in the form of a budget allocation is, of course, essential. More than that, though, management must demonstrate belief in the effectiveness and necessity of vaccination. In one hospital, the president, CEO and COO are the first to receive the vaccine. In another, top management volunteers time to hand out vaccine information sheets to employees during vaccination campaigns. With the support of senior staff, departments are more likely to work together to achieve higher immunization rates.

Strategy: Create a policy statement affirming institutional commitment to increasing health care worker influenza vaccination rates

Health care institutions should put their commitment in writing if they believe everyone who comes in contact with patients should receive influenza vaccine annually. The written policy should be communicated to all employees to ensure each has read it and realizes his or her role in achieving it. This is particularly important for professional societies that want members to know they believe in vaccination as a personal and patient safety measure.

Strategy: Use every possible means to deliver messages

Information needs to be communicated to health care workers to reinforce the importance of being vaccinated. Whether it's educational information about why the vaccine works or logistical information about where and when to get vaccinated, all means possible should be used to deliver the message. Communications vehicles can include:

- E-mail notices and reminders to the entire staff are a quick and efficient method of notification
- An employee newsletter may require more lead time than e-mail, but articles in the newsletter may get to staff who do not access e-mail. There may be a need to provide information in languages other than English to reach specific non-English-speaking employee populations.
 - A series of articles may begin well in advance of influenza season. Early articles might include "Facts About Influenza," "Tips To Avoid the Flu," and "Our Influenza Vaccine Policy."
 - Articles printed just before influenza season might focus on influenza vaccine effectiveness, and myths and misconceptions about influenza vaccine. These issues may begin to publicize influenza clinic dates.
 - During the influenza season, articles might include influenza

clinic results report and further promotion of upcoming clinic schedules.

- Posters advertising times and locations for vaccine programs (and perhaps providing educational "booster" messages) should be placed throughout the facility.
- Personal announcements can deliver information during department meetings, grand rounds or employee health fairs.
- Employees who have been vaccinated can prominently wear stickers that say, "I got my flu shot." It is particularly effective when the hospital president or medical director sports a sticker.
- Screen savers reminding staff to be vaccinated can be sent to all users by systems administrators.

Strategy: Provide education and reeducation

Ongoing education is needed to reduce and eliminate misinformation.

The health care worker population includes a wide variety of people with a wide range of knowledge. Educational messages may need to be delivered by a variety of vehicles, at many different levels, perhaps in two or more languages, and certainly many times over.

Although some information will be retained from year to year, most people will require yearly reminders. In addition, new employees start throughout the year, and students of the health care professions rotate for limited periods, so they may not have heard the messages in previous years.

Strategy: Make influenza vaccine easily accessible

It is essential to make vaccine accessible to health care workers and other employees. Several methods to do so are included here.

- Rolling carts bring the vaccine to the employees, wherever they may be. Many areas may prove fruitful in increasing vaccine uptake, such as:
 - Cafeterias at lunch and break times
 - Employee entrance or parking garages during shift changes
 - Grand rounds or other medical conferences
 - Medical records areas where all physicians and most residents must go to sign charts

-
- Departmental meetings, including regularly scheduled faculty and house staff meetings. This strategy coincides nicely with management participation—department managers should roll up their sleeves first.
 - Even without a departmental meeting, taking the cart to each department can yield positive results. Include all areas—medical, radiology, laboratories, human resources, facilities management, food services, laundry, etc.
 - “Flu deputies” can be named in each patient care area to assume responsibility for educating and vaccinating health care workers assigned to the area.
 - Vaccination clinics should be held at a variety of times (i.e., make sure clinics are available for all shifts) and, if necessary, various locations, especially if employees work in multiple physical locations. Clinics should be designed to make the process as quick and easy as possible. Staffing needs should be considered carefully. It may be more effective to offer scheduled appointments versus walk-in clinics.
 - No matter which accessibility strategies institutions use, the ideal is to employ various approaches in multiple waves. Taking a rolling cart through a ward just once may miss a nurse who was at an in-service that day. Employees may be on vacation the week a vaccine clinic is held.

Strategy: Remove cost barriers to immunization

Influenza vaccination of health care workers protects patients. As such, vaccination is an infection control and patient safety measure that is the ultimate fiscal responsibility of the institution. When an institution makes the decision to pay for influenza vaccination for all employees, it underscores its commitment to, and the importance of, patient safety.

Strategy: Audit immunization programs and provide feedback to key personnel

Success cannot be claimed until it is measured. Strategies should be tested and checked to ensure they are working as planned. Busy medical professionals very often do not have a clear picture

of whether their immunization efforts are successful. For example, in one study, physicians claimed they took advantage of every opportunity to vaccinate during well-child or follow-up visits.³⁷ Upon review, though, only 60 percent used every well-child visit as an opportunity to vaccinate and just over 20 percent used every follow-up visit.

One way to measure success is simply to track doses given and calculate the percentage of employees who have been immunized. It is even more effective to track by location to assure the units with the highest risk patients have adequate health care worker vaccination rates.

If the percentage is high, employees should know their efforts to protect themselves and their patients are appreciated. If the percentage is lower than anticipated, employees should be advised of the institution’s immunization goals and how and why they should help meet these goals. If a particular department has done well, it should be publicly applauded.

Strategy: Repeat the influenza immunization program annually

No program or set of strategies will work in the long term if stopped after just one season. Employees hired between influenza seasons will not have been part of the previous year’s efforts, and those who were present but chose not to be vaccinated earlier will benefit from hearing messages again. Finally, while studies show individuals who have received influenza vaccine in the past are likely to do so again, not all will seek it out. They, too, need access to a convenient, low- or no-cost influenza vaccine.

Case Model: Brigham and Women's Hospital

Planning and Management: A Year-Long Effort For Health Care Worker Immunization Program

To get an idea of what's required to plan and manage a health care worker influenza program, look at this month-by-month calendar of employee vaccination events adapted from one in use at Brigham and Women's Hospital, Boston, Massachusetts.

February/March

- Collaborate with pharmacy personnel to order the appropriate amount of influenza vaccine for the coming season

April/May/June

- Develop OHS budget for upcoming Employee Influenza Program (EIP)
- Submit proposed EIP budget to management and secure required funding
- Maintain ongoing communications with vaccine supplier regarding vaccine order (done by Pharmacy)
- Order CDC educational materials about influenza for upcoming season
- Monitor influenza updates from CDC regarding upcoming flu season (*MMWR Morbidity and Mortality Weekly Report* and <http://www.cdc.gov>)

July/August

- Conduct kickoff meeting of Flu Planning Committee (OHS and Infection Control) for upcoming EIP
- Select annual theme for EIP (e.g., Bee Wise, Immunize)
- Develop preliminary promotional and logistical plan for EIP
- Maintain ongoing communications with vaccine supplier regarding vaccine order (done by Pharmacy)
- Monitor influenza updates from CDC regarding upcoming flu season

September

- Conduct Flu Planning Committee meeting
- Refine promotional and logistical plan for EIP
- Order promotional balloons, buttons, posters and stickers
- Make preliminary arrangements for per diem nurse staffing during Flu Shot Week (first full week in November)
- Begin promoting EIP to employees via print and electronic communications
- Begin receipt of influenza vaccine by Pharmacy
- Monitor influenza updates from CDC

October

- Conduct Flu Planning Committee meeting
- Provide training for nursing and administrative staff assisting with EIP
- Continue promoting EIP to employees via print and electronic communications
- Finalize logistics and staffing plan for EIP
- Receipt of influenza vaccine by Pharmacy
- Receipt of promotional balloons, buttons, posters and stickers
- Monitor influenza updates from CDC
- Be prepared to initiate EIP early if there are signs of an early season, as in Fall 2003

November

- Administer vaccinations to employees during Flu Shot Week (first full week in November)*
- Monitor operations daily during Flu Shot Week; troubleshoot as necessary and identify opportunities for improvement
- Conduct additional influenza clinics on main campus and off site, as required
- Conduct "Flu Rounds" on nursing units
- Continue influenza vaccination communications to employees

* The CDC recommends that health care worker vaccination begin in October. Although Brigham and Women's Hospital holds their Flu Shot Week at the beginning of November, they offer influenza vaccine as soon as it becomes available each year.

- Monitor influenza updates from CDC
- Once admission of patients with influenza to the health care facility begins, monitor nosocomial transmission of influenza, assess health care worker vaccination rates in those patient care areas with nosocomial transmission and revisit with influenza vaccine cart

December

- Conduct additional flu clinics on main campus and off site, as required
- Offer influenza vaccine wherever and whenever providing OHS services to employees
- Provide vaccinations in OHS clinics on walk-in basis
- Offer influenza vaccine to all BWH employees exposed to patients with influenza
- Critique completed Flu Shot Week; identify opportunities for improvement
- Monitor influenza updates from CDC

January

- Offer influenza vaccine wherever and whenever providing OHS services to employees
- Provide vaccinations in OHS clinics on walk-in basis
- Offer influenza vaccine to all BWH employees exposed to patients with influenza
- Critique completed employee vaccination campaign; identify opportunities for improvement
- Develop preliminary estimates of vaccine order quantities for next influenza season
- Monitor influenza updates from CDC

February/March

- Offer influenza vaccine wherever and whenever providing OHS services to employees
- Provide vaccinations in OHS clinics on walk-in basis
- Offer influenza vaccine to all BWH employees exposed to patients with influenza

- Finalize vaccine order quantities for upcoming influenza season and order from supplier via Pharmacy
- Monitor influenza updates from CDC

April/May/June

Begin planning for next year's immunization program

- Develop OHS budget for upcoming EIP
- Submit proposed EIP budget to management and secure required funding
- Maintain ongoing communications with vaccine supplier regarding vaccine order (done by Pharmacy)
- Order CDC educational materials about influenza for upcoming season
- Monitor influenza updates from CDC regarding upcoming influenza season

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