

SHEA POSITION PAPER

Revised SHEA Position Paper: Influenza Vaccination of Healthcare Personnel

Thomas R. Talbot, MD, MPH; Hilary Babcock, MD, MPH; Arthur L. Caplan, PhD; Deborah Cotton, MD, MPH;
Lisa L. Maragakis, MD, MPH; Gregory A. Poland, MD; Edward J. Septimus, MD;
Michael L. Tapper, MD; David J. Weber, MD, MPH

EXECUTIVE SUMMARY

This document serves as an update and companion piece to the 2005 Society for Healthcare Epidemiology of America (SHEA) Position Paper entitled "Influenza Vaccination of Healthcare Workers and Vaccine Allocation for Healthcare Workers During Vaccine Shortages."¹ In large part, the discussion about the rationale for influenza vaccination of healthcare personnel (HCP), the strategies designed to improve influenza vaccination rates in this population, and the recommendations made in the 2005 paper still stand. This position paper notes new evidence released since publication of the 2005 paper and strengthens SHEA's position on the importance of influenza vaccination of HCP. This document does not discuss vaccine allocation during times of vaccine shortage, because the 2005 SHEA Position Paper¹ still serves as the Society's official statement on that issue.

SHEA views influenza vaccination of HCP as a *core patient and HCP safety practice* with which noncompliance should not be tolerated. It is the professional and ethical responsibility of HCP and the institutions within which they work to prevent the spread of infectious pathogens to their patients through evidence-based infection prevention practices, including influenza vaccination. *Therefore, for the safety of both patients and HCP, SHEA endorses a policy in which annual influenza vaccination is a condition of both initial and continued HCP employment and/or professional privileges.* The implementation of this policy should be part of a multifaceted, comprehensive influenza infection control program; it must have full, visible leadership support with the expectation for influenza vaccination fully and clearly communicated to all existing and applicant HCP; and it must have ample resources

and support to implement and to sustain the HCP vaccination program. This recommendation applies to all HCP working in all healthcare settings, regardless of whether the HCP have direct patient contact or whether the HCP are directly employed by the facility. It also applies to all students, volunteers, and contract workers. SHEA recommends that only exemptions due to recognized medical contraindications to influenza vaccination be considered.

BACKGROUND

The transmission of influenza in the healthcare setting is an underrecognized yet substantial safety concern that places patients, other staff, and HCP at risk. Preventing the spread of influenza involves initiation of a comprehensive infection control program designed to identify and to isolate infectious persons while using work practice controls to reduce the risk of influenza transmission. Rapid identification and isolation of patients suspected to have infection, adherence to hand hygiene and respiratory etiquette, source control by the masking of persons with influenza-like illness (ILI), patient cohorting, use of personal protective equipment, restriction of ill HCP from working in the facility and of ill visitors from visiting, and antiviral prophylaxis and treatment (when indicated) all play essential roles in the reduction of transmission of any healthcare-associated respiratory infection, including influenza. Unlike efforts to prevent transmission of other respiratory viruses, however, vaccination of both patients and their contacts is the cornerstone of efforts to prevent influenza transmission. Influenza vaccination is a highly effective tool to prevent laboratory-confirmed influenza infection, particularly in healthy adults during seasons in which

From the Departments of Medicine and Preventive Medicine, Vanderbilt University School of Medicine (T.R.T.), and Hospital Corporation of America (E.J.S.), Nashville, Tennessee; Department of Internal Medicine, Washington University School of Medicine, St Louis, Missouri (H.B.); Department of Medical Ethics, University of Pennsylvania, Philadelphia (A.L.C.); Department of Medicine, Boston University School of Medicine (D.C.), and the Department of Epidemiology, Boston University School of Public Health (D.C.), Boston, Massachusetts; Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland (L.L.M.); Department of Medicine, Mayo Clinic College of Medicine, Rochester, Minnesota (G.A.P.); Texas A & M Health Science Center, Houston (E.J.S.); Lenox Hill Hospital and the New York University School of Medicine, New York (M.L.T.); and the Departments of Medicine and Pediatrics, University of North Carolina at Chapel Hill (D.J.W.). D.C. and G.A.P. are liaisons from the Infectious Diseases Society of America.

Received July 30, 2010; accepted August 2, 2010; electronically published August 25, 2010.

Infect Control Hosp Epidemiol 2010; 31(10):000-000

© 2010 by The Society for Healthcare Epidemiology of America. All rights reserved. 0899-823X/2010/3110-00XX\$15.00. DOI: 10.1086/656558

there is a close match between the vaccine and the circulating strains. A mismatch between the vaccine and the circulating wild-type strains is infrequent, but even in years with a substantial mismatch, the vaccine still may be partially effective. For example, data from the 2007–2008 influenza season showed that, even when 2 of the 3 vaccine strains were sub-optimally matched to circulating strains, vaccine effectiveness was substantial.² Influenza vaccination of patients is an important strategy in preventing influenza transmission, and a study in 301 long-term care facilities noted that high rates of *both* HCP and patient vaccination were significant predictors of reduced nosocomial influenza outbreaks.³ However, the protection provided by vaccination is reduced in certain populations (eg, young children, immunosuppressed persons, and older adults), which compose a large percentage of the patient population encountered in most healthcare settings. Thus, vaccination of HCP, who are usually healthy adults in whom vaccine immunogenicity, and hence efficacy, is highest, is essential to help reduce the transmission of influenza to the patients for whom they care.

Vaccination of HCP serves several purposes: (1) to prevent transmission to patients, including those with a lower likelihood of vaccination response themselves; (2) to reduce the risk that the HCP will become infected with influenza; (3) to create “herd immunity” that protects both HCP and patients who are unable to receive vaccine or unlikely to respond with a sufficient antibody response; (4) to maintain a critical societal workforce during disease outbreaks; and (5) to set an example concerning the importance of vaccination for every person. Importantly, modeling studies have estimated that in both acute care and long-term care settings, there is no HCP vaccination rate above which additional HCP vaccination coverage will not lead to further protection of patients.^{4,5} In these studies, vaccination of 100% of HCP in the acute care model resulted in a 43% reduction in the risk of influenza among hospitalized patients and a 60% risk reduction among nursing home patients. Several studies also have found influenza vaccination of HCP to be a cost-effective strategy to prevent patient morbidity.^{6,7}

Importantly, several studies now demonstrate that HCP influenza vaccination reduces patient mortality. In addition to the 2 studies^{8,9} noted in the 2005 SHEA position paper,¹ 2 subsequent cluster randomized trials have found that vaccination of HCP in a long-term care setting was significantly associated with reductions in patient mortality. The first study, performed in 44 facilities and involving more than 1,700 HCP and 2,600 residents, reported a significant decrease in patient mortality, ILI, ILI consultations with general practitioners, and ILI hospitalizations during a moderate influenza season among residents of homes in the HCP vaccination arm, compared with those residing in control facilities.¹⁰ These reductions were noted even in settings with high rates of resident vaccination (78.2% in the intervention homes vs 71.4% in the control facilities). Another study, conducted in France among 40 facilities that included 2,000 HCP and

nearly 3,500 residents, noted a significant reduction in the risk of all-cause patient mortality between the 2 study arms even after adjustment for resident age, resident vaccination status, resident disability score, and Charlson comorbidity index (odds ratio, 0.80 in intervention arm vs control arm).¹¹ Increased HCP vaccination rates also significantly correlated with reduced patient mortality rates.

This striking benefit for patients in long-term care facilities from vaccination of their HCP is remarkably consistent across all 4 studies. Some have argued that these studies do not provide evidence that vaccinating HCP against influenza protects elderly long-term care residents because the outcomes of noted benefit were nonspecific and were not laboratory-confirmed influenza.¹² Although each of these studies, like every study, has inherent limitations and biases, the consistency of impact of HCP vaccination across the 4 trials argues persuasively for the positive impact of influenza vaccination of HCP on reducing mortality of residents of extended care facilities. Some have claimed that the results from these studies may not apply to the acute care setting, calling for similar studies in each unique patient population. This stance, however, ignores several key points. First, performing a similar trial in the acute care setting would be exceedingly challenging and resource intensive, given the increased number of HCP-patient interactions, the shorter length of stay, and the difficulty of attributing influenza acquisition to healthcare-associated exposure. Second and more importantly, the biological rationale for vaccination of HCP to reduce influenza spread does not vary by practice setting. As noted in the 2005 SHEA Position Paper,¹ otherwise healthy adults (who presumably represent a large proportion of the HCP population) are infected routinely with influenza virus, with HCP likely to be at higher risk because of increased contact with infected patients seeking care. Infected HCP may shed virus before the development of clinical symptoms, in addition to shedding virus even when their symptoms are mild and not recognized as ILI. HCP have frequent direct contact with patients at high risk of morbid complications due to influenza, and yet HCP routinely report to work ill with respiratory symptoms.^{13,14} Finally, influenza vaccination has been shown in randomized controlled trials to reduce the incidence of laboratory-confirmed influenza infection in healthy adults.^{15,16} Thus, regardless of the specific practice setting, interventions that reduce acquisition of influenza will reduce influenza transmission. In addition, influenza vaccination has been shown to reduce HCP absenteeism,¹⁶ which also has potential patient safety benefits by reducing HCP-to-patient staffing ratios.^{17,18} Therefore, improving HCP influenza vaccination rates is a patient and HCP safety imperative.

Unfortunately, despite tremendous efforts to promote HCP influenza vaccination by government agencies, regulatory groups, professional societies, and visible vaccination champions, influenza vaccination rates among HCP remain unacceptably low. In a 2009 report by the Research and Development (RAND) Corporation, only 53% of surveyed HCP

reported receipt of influenza vaccination during the 2008–2009 influenza season.¹⁹ In addition in 2009, 39% of HCP stated they had no intention of getting vaccinated even with the heightened concern surrounding influenza with the novel H1N1 influenza A pandemic.²⁰ These data mirror findings from the National Health Interview Survey in which HCP influenza vaccination rates did not change significantly from the 2003–2004 influenza season (44.8%) through the 2007–2008 season (49.0%).²¹

IMPLEMENTATION OF POLICIES THAT REQUIRE INFLUENZA VACCINATION AS A CONDITION OF EMPLOYMENT

Since initial publication of the 2005 SHEA Position Paper,¹ and with continued frustration surrounding low and unimproved HCP vaccination rates, a move to the use of mandatory vaccination policies has occurred. Multiple hospitals and health-care systems now require influenza vaccination of HCP as a condition of employment. The first to implement such a policy was the Virginia Mason Medical Center (VMMC; Seattle, WA). In August 2004, prompted by suboptimal vaccination rates and their belief that voluntary programs were not an effective tool to boost vaccination coverage, VMMC leaders mandated influenza vaccination for all hospital personnel. This policy also included non-VMMC employees working at the medical center (eg, community physicians, vendors, students, and volunteers). Signed declinations for those without medical contraindications to the vaccine were not allowed. Despite notable initial resistance to the policy (discussed in further detail below), vaccination rates for the population of more than 5,000 VMMC employees and adjunct personnel have been sustained at greater than 98% in the 4 years since the program was implemented.^{22,23}

Similarly dissatisfied with an HCP vaccination rate of 71%, leaders at BJC Healthcare (St Louis, MO) made influenza vaccination a condition of employment before the 2008–2009 season.²⁴ Defined medical and religious exemptions were allowed. Encompassing nearly 26,000 employees at 11 acute care and 3 extended care facilities, BJC Healthcare achieved an impressive HCP influenza vaccination rate of 98.4%. Emphasizing the institutional commitment to this safety practice, there were 8 employees who were terminated for failure to meet conditions of employment.

During the 2009–2010 influenza season, the Hospital Corporation of America also implemented a mandatory vaccination policy for all of its 163 facilities throughout the United States. Differing from the VMMC and BJC Healthcare models, this model allowed personal belief exemptions along with medical and religious exemptions. The program was driven by visible leadership expectations centered on the message of patient safety. Hospital Corporation of America achieved a remarkable 96.4% vaccination rate among their more than 140,000 employees, of whom only 3.6% declined for any reason.²⁵ During that same season, the MedStar Health system of 9 hospitals in Maryland and the District of Columbia

achieved a vaccination rate of 98% among their approximately 26,000 employees and affiliated HCWs (including a 95% vaccination rate among affiliated physicians) after implementing a mandatory vaccination program (L. V. Karanfil, written communication, March 16, 2010).

These are but a few examples of healthcare facilities and systems that have moved successfully to a mandatory influenza vaccination policy. Other institutions and health systems, including the Hospital of the University of Pennsylvania (Philadelphia), Children's Hospital of Philadelphia (Philadelphia, PA), Emory University Hospital (Atlanta, GA), University of California Davis Health System (Sacramento, CA), Loyola University Health System (Maywood, IL), University Hospital (Cincinnati, OH), and multiple community hospitals, have established mandatory vaccination programs, and many others are strongly considering a similar policy for the 2010–2011 season. An up-to-date listing of health systems and healthcare facilities that require influenza vaccination for their HCP is provided by the Immunization Action Coalition.²⁶

In 2009 New York became the first state to require HCP influenza vaccination, issuing an emergency regulation that required influenza vaccination for all general hospital, home health, home care, and hospice HCP who had “direct contact with patients or whose activities are such that if they were infected with influenza, they could potentially expose patients, or others who have direct contact with patients, to influenza.”²⁷ Instituted in the midst of the 2009 novel H1N1 influenza A pandemic, the regulation was suspended for latter part of the 2009–2010 season because of issues related to vaccine availability. However, the State of New York Department of Health is drafting a permanent regulation regarding HCP influenza vaccination.²⁸

Studies of various HCP populations often have found that a majority of HCP accept the concept of mandatory influenza vaccination. A study among HCP at a tertiary children's hospital noted that 70% of respondents believed vaccination should be mandatory for HCP without a medical contraindication.²⁹ In another survey, 59.3% of inpatient nurses at the Mayo Clinic supported a policy that required influenza vaccination with exemptions allowed for medical and religious reasons or if the HCP provided a signed declination.³⁰ In this latter study, agreement with mandatory vaccination policies was strongly correlated with the length of time each policy had been in place—thus agreement with a mandatory hepatitis B virus vaccination policy was extremely high, with lower support for measles, mumps, and rubella (MMR) vaccination, lower yet for varicella vaccination, and lowest for influenza vaccination—reflecting the length of time each policy had been in place (G.A.P., written communication, 2010). A survey of academic physicians in the University of Pennsylvania Health System noted that 84.6% of respondents supported mandatory influenza vaccination of HCP.³¹ In a survey of SHEA members performed during the 2009–2010 pandemic influenza season, 78.2% of respondents agreed or strongly agreed with the statement “all healthcare workers

should be mandated to receive the flu vaccine or risk losing their jobs.^{33,34}

Some have argued that mandatory influenza vaccination policies are coercive and negatively impact the employee-employer relationship.^{33,34} However, no data are available that support such a claim. Every healthcare institution already has multiple conditions of employment for HCP that are designed to reduce the risk of infectious disease transmission and to improve patient safety. Requirements for immunity to or vaccination against varicella, measles, mumps, and rubella are standard for most healthcare facilities. Those against vaccination mandates argue that influenza vaccination differs from these obligations, because of the annual requirement for vaccination and the invasiveness of the intervention. However, annual requirements for tuberculin skin testing, also an invasive intervention, are already commonplace at healthcare facilities. Furthermore, HCP are required to provide care to persons infected with potentially communicable diseases (eg, tuberculosis or HIV infection) even if that care (eg, surgery) entails a risk of disease acquisition.

Much discussion has occurred surrounding the ethics and legality of mandatory influenza vaccination programs for HCP.³⁵⁻⁴¹ Those against mandatory programs argue that the data supporting the impact of HCP influenza vaccination on patients are inconclusive, that voluntary programs have not been given enough time to have an impact or have not addressed attitudinal barriers to vaccination effectively, and that such policies may place patient protection above HCP autonomy and do not respect HCP autonomy. These practical and moral arguments are not persuasive.

Voluntary vaccination programs have been in place for decades with little evidence for an overall increase in HCP vaccination rates. Furthermore, multifaceted mandatory vaccination programs have been tried and tested and have been found to be the single most effective strategy to increase HCP vaccination rates, with multiple facilities and systems achieving vaccination coverage of more than 95%.⁴²

Those in support of mandatory programs argue that influenza vaccination is an ethical responsibility of HCP, because HCP have a duty to act in the best interests of their patients (beneficence), to not place their patients at undue risk of harm (nonmaleficence), and to protect the vulnerable and those at high risk of infection. The duty to put patient interests first is outlined in nearly every professional code of ethics in medicine, nursing, and other healthcare fields. Because the likelihood of a serious adverse reaction to influenza vaccine is extremely low, the duty to protect vulnerable patients and to put their interest above the personal interest of the healthcare worker does not demand undue sacrifice. Finally, the use of mandatory vaccination programs for the public health and protection of the greater population has clear legal precedents.³⁹

VARIOUS STRATEGIES THAT MAY BE USED TO IMPLEMENT MANDATORY HCP INFLUENZA VACCINATION PROGRAMS

Employee vaccination programs may differ in the various tools used to implement a policy of mandatory influenza vaccination of HCP as a condition of employment. As noted in the 2005 SHEA Position Paper,¹ programmatic principles should include that the program be comprehensive and provide ready access to vaccination, provision of vaccination free to HCP, targeted education that emphasizes the rationale for a mandatory policy, leadership commitment, and resources. In this section we describe some newer strategies used by healthcare facilities to improve influenza control programs that also may have a role in a mandatory vaccination program and that provide tools for those rare individuals who cannot receive vaccination or who refuse to participate in the influenza vaccination program.

Use of Vaccination Rates as a Measure of a Facility's Safety and Quality Program

One method to help increase influenza vaccination rates is through shared reporting of individual facility influenza vaccination rates as an indicator of an institution's commitment to the delivery of safe, quality care. Appropriate concerns regarding public reporting of other healthcare-associated infection outcomes, such as risk adjustment and comparability of patient populations between different facilities, are negligible when examining HCP vaccination rates. HCP vaccination rates and aspects of a facility's vaccination program have already been included in various assessments of the quality of patient care as a patient safety indicator.^{43,44} A strategy involving shared disclosure of vaccination rates has been successful in Iowa, in which a voluntary collaborative involving all 115 acute care hospitals in the state reported institution-specific vaccination rates and strategies used to improve those rates to all member facilities.⁴⁵ Although these data were not reported to the general public, this program led to median vaccination rates of 82% in the second year of the program. Coupling such reporting with vaccination mandates would serve to drive these rates even higher. However, before reporting such data as a quality metric, the HCP population included in a facility's measurement must be clearly defined to allow for accurate interfacility comparisons. In addition, such programs should report actual HCP vaccination rates, rather than overall vaccination program participation rates, which may be elevated because of high rates of vaccination refusal or exemption.

Requiring Unvaccinated HCP to Wear a Mask during the Influenza Season

Some organizations that have implemented a mandatory vaccination program also have required those HCP who refuse

or are unable to receive the vaccination to wear a surgical mask while performing clinical care duties during the influenza season.^{23,25} The rationale behind such a strategy is that the masks can serve as a method for source control of infected HCP who may have limited or no symptoms yet who still may shed virus; the masks also protect unvaccinated HCP from as-yet-unrecognized, unisolated influenza patients.⁴⁶ The use of masks, in conjunction with hand hygiene, has been associated with a reduction in rates of ILI in residents of college dormitories and households.^{47,48} The requirement for mask use may prompt HCP to review more closely the risk-benefit ratio for vaccination and to choose to receive the vaccination. Although largely anecdotal, such an effect has been reported by researchers in Germany, where HCP vaccination rates climbed from 33% to 51.7% in the 10 days following implementation of a requirement for unvaccinated HCP to wear a mask during all direct patient contact.⁴⁹ Such data have led some groups to recommend such requirements as part of a mandatory vaccination program.⁵⁰

There are, however, potential issues related to the masking requirement. Implementation of such a policy is logistically challenging (eg, developing methods to identify those HCP required to wear a mask during clinical care in order to correct noncompliance). Some institutions have used identification badge stickers or buttons for such a purpose. The use of such identifiers, however, may risk stigmatizing those HCP with legitimate contraindications to vaccination and has raised concerns regarding HCP's right to privacy. If used, such identifiers should be crafted in a manner that positively reinforces the rationale for mask use. For example, some systems have used nonpunitive identification badges for both vaccinated and unvaccinated HCP with safety messages that positively emphasized the HCP's role in preventing infection in their patients, whether through vaccination or through wearing a mask (Figure 1).

Although SHEA does not specifically endorse policies that require unvaccinated HCP to wear a mask during the influenza season, the Society believes there is potential utility in this strategy to prevent inadvertent transmission of influenza and perhaps also to achieve higher vaccination coverage.

Use of Signed Declination Statements for HCP Who Refuse Vaccination

In its 2005 Position Paper,¹ SHEA supported the use of signed declination statements for those persons refusing vaccination as a tool to reinforce the risks associated with unvaccinated HCP to both patients and the HCP themselves. Since publication of the 2005 SHEA Position Paper,¹ more data on the impact of these statements have become available. The use of such statements as a part of a comprehensive vaccination program has led to modest increases in coverage in some instances.⁵¹⁻⁵⁴ The impact of such statements, however, is variable,^{55,56} likely affected by the content of the declination (eg, wording that notes risks to patients by refusing vaccination) as well as its context (eg, a requirement for a face-to-face meeting to review the reasons for refusal, or an Internet-based tool).⁴² Accordingly, use of these statements should not be viewed as the primary method for increasing vaccination rates. In the context of mandatory HCP influenza vaccination programs with limited exemptions to vaccination, the use of these statements may be limited. If used, such statements should outline all expected infection control practices the HCP should perform to reduce influenza transmission and should note the impact of unvaccinated HCP.

REVISED SHEA POSITION ON INFLUENZA VACCINATION OF HCP

SHEA views influenza vaccination of HCP as a *core patient and HCP safety practice* with which noncompliance should



FIGURE 1. Example of badge identifiers for both vaccinated (A) and unvaccinated (B) healthcare personnel used as part of the mandatory influenza vaccination program of Hospital Corporation of America (courtesy of E. Septimus).

not be tolerated. We believe that it is the professional and ethical responsibility of HCP and the institutions within which they work to prevent the spread of infectious pathogens to their patients by following evidence-based infection prevention practices. Just as HCP would not be allowed to participate in a surgical procedure without first performing an appropriate surgical hand scrub or wearing appropriate sterile attire, failure to perform a basic patient safety intervention, such as influenza vaccination, is unacceptable. Therefore, for the safety of patients and HCP, SHEA endorses a policy in which influenza vaccination is an ongoing condition of HCP employment, unpaid service, or receipt of professional privileges.

Although it is a cornerstone in prevention, influenza vaccination is not and cannot be the only intervention used for the prevention of influenza transmission in healthcare settings. This policy must be implemented as part of a multifaceted, comprehensive infection control program (as outlined in the SHEA 2005 Position Paper¹) that emphasizes all aspects of an influenza control program: it must have full, visible leadership support with the expectation for vaccination fully and clearly communicated to all HCP, and it must be provided with adequate resources and support for the HCP vaccination program. As noted above, it also must address all the practices necessary to reduce the spread of influenza in healthcare settings, including patient isolation, use of personal protective equipment, hand hygiene, and visitor and HCP restriction when ill. Because the types of HCP included in vaccination programs may vary, with contract staff, private physicians, students, and volunteers often excluded, this recommendation applies to all HCP practicing in all healthcare settings (including contract workers, independent practitioners, volunteers, students, and product vendors), regardless of whether the HCP have direct patient contact or whether the HCP are directly employed by the facility.^{57,58}

Exemptions to influenza vaccination mandates should be allowed only for medical contraindications to vaccination, specifically allergy to eggs and prior allergic or severe adverse reactions to influenza vaccine. Such exemptions should be adequately documented and reviewed before allowing exemption from this requirement. Some facilities have allowed religious exemptions as part of HCP vaccination programs requiring that those requesting a religious exemption demonstrate a deeply held conviction, as determined by review by an institutional panel. However, most religions do not prohibit vaccination. Legal pressures to avoid discrimination implied by allowing religious exemptions for only one religion or by requiring an individual to belong to an organized religion in order to get a religious exemption have broadened the use of religious exemptions to others. Because vaccination of HCP is a patient safety and public health intervention, SHEA does not endorse the use of religious exemptions to influenza vaccination, because failure to be vaccinated results in an unacceptable risk to patients and other HCP. Legal support for such policies has been noted with school-entry

vaccination requirements, in which the absence of religious exemptions has been legally upheld against objections that such policies infringed on individuals' religious principles.³⁹

Personal belief or philosophical exemptions (eg, for those who do not believe in the need for influenza vaccination or for those who are opposed to the concept of *mandatory* vaccination) should not be allowed. The allowance of personal belief exemptions for school-entry vaccination requirements has been associated with an increased risk of the acquisition and transmission of vaccine-preventable diseases.⁵⁹ Although a few facilities and systems have been successful in achieving high vaccination rates in the setting of personal belief exemptions,^{25,60} allowance of personal belief exemptions runs counter to the concept that HCP influenza vaccination is a core patient safety intervention from which the HCP cannot merely opt out, particularly given the known safety and efficacy of influenza vaccination.

SHEA now joins multiple organizations and regulatory agencies that have recommended influenza vaccination be a condition of employment for HCP. In 2008, the Department of Defense expanded the policy requiring influenza vaccination for all Department of Defense HCP providing direct patient care in military treatment facilities to include all contract and other civilian HCP working in such a capacity.⁶¹ The Infectious Diseases Society of America revised their recommendations on HCP influenza vaccination in 2009 to endorse "universal immunization of health care workers against seasonal...influenza by health care institutions through mandatory vaccination programs," allowing only medical and religious exemptions.⁵⁰ The Association of Professionals in Infection Control and Epidemiology has also recommended that "influenza vaccine...be required annually for all healthcare personnel with direct patient care," but allows for personal belief exemptions by means of signed declinations.⁶² Recommending that only medical exemptions be allowed, the National Patient Safety Foundation also now endorses mandatory influenza vaccination of HCP "to protect the health of patients, health care workers, and the community."⁶³

CHALLENGES TO MANDATORY INFLUENZA VACCINATION PROGRAMS

A program that requires influenza vaccination as a condition of employment, privileges, or other hospital activity, such as volunteer work, may be met with several challenges that should be identified and addressed in advance in order to successfully implement this patient safety program. Visible and emphatic leadership expectation for vaccination is essential, as is accountability for vaccination, by means of annual performance evaluations or physician credentialing requirements. Managers and leaders must be provided with the vaccination compliance data at regular timely intervals. In addition to leadership support, vaccination programs must have appropriate allocation of resources (financial resources and personnel). Plans and policies to capture HCP influenza

vaccination receipt outside of the formal employee vaccination program must be developed to document and to allow for accurate assessment of vaccination coverage. In addition, policies requiring vaccination must consider the impact of factors that may limit the availability of vaccine, and facilities should modify such requirements during instances of vaccine shortages.

Because influenza vaccine manufacturing has expanded significantly, shortages are expected to be less common than in the past. Nonetheless, should vaccine shortages occur, it may be appropriate for influenza vaccination requirements to be prioritized to those personnel at highest risk of exposure to infected patients or to those who provide the highest degree of contact (eg, prolonged duration and frequency of contact) to patients at high risk for influenza complications. Vaccination program leadership should be cognizant that messages about vaccine prioritization at the time of shortages may cause some confusion. HCP may infer that vaccine prioritization implies that vaccination is really important only for certain HCP. Therefore, it is essential to emphasize that, although the best strategy for preventing healthcare-associated influenza transmission involves protection of both HCP and patients through universal vaccination, in times of limited resources, a less-than-optimal approach is needed. Program leaders also should emphasize that HCP not targeted by the vaccination prioritization need to use fully the other protective modalities (eg, early recognition of cases, use of personal protective equipment, and strict adherence to hand hygiene) to prevent viral transmission.

Opponents of mandatory HCP vaccination policies cite several concerns regarding a mandatory approach. Specifically, some believe that such policies could place frontline HCP, who are essential for implementation of other key infection prevention initiatives, at odds with facility leadership. SHEA agrees that frontline HCP are key to successful infection prevention, quality improvement, and safety programs. However, clear communication to all existing and potential (ie, applicant) HCP regarding the rationale for an influenza vaccination requirement (ie, that the goal is to protect both patients and HCP) and a trusting partnership of leadership with frontline workers in implementing this safety initiative will help address these concerns. Among the multiple institutions that have already instituted such conditions of employment, extraordinarily high levels of acceptance have been demonstrated. In addition, having leaders at the highest level, rather than midlevel managers, set policy regarding employee vaccination may further lessen potential friction with frontline personnel. The success of mandatory vaccination programs at institutions such as VMMC, BJC Healthcare, and Hospital Corporation of America can be attributed completely to strong leadership messaging and partnership with all HCP, and a consistent focus on the goal of patient safety and welfare consistent with the ethics of the healthcare professions. Other opponents of mandatory vaccination programs have voiced concerns that such mandates will divert

resources from and reduce adherence to basic influenza infection control practices, such as hand hygiene; however, non-adherence to other practices in circumstances with similar safety requirements has not been documented and does not appear to be a valid concern.

A major challenge to mandatory influenza vaccination programs involves potential resistance by organized employee organizations. For example, the VMMC program was faced with a legal challenge from the Washington State Nurses Association, which led to the adoption of a policy requiring masks for all unvaccinated HCP. It should be noted that these groups and the HCP they represent for the most part do not oppose the concept of influenza vaccination but rather the mandatory nature of such policies. However, vaccination is a core preventive patient safety method and should be required, as it is required to wear appropriate attire in the operating room, it is prohibited to wear artificial fingernails, and it is required to provide care to patients regardless of underlying disease, even when they have disease that might place the HCP at some risk (eg, pandemic influenza, viral hemorrhagic fever, bloodborne pathogen infection, and other illnesses). One hopes that, in the interests of protecting both patients and their members, these organizations will not oppose mandatory programs that are developed in collaboration with employees, with transparency and due process for needed exemptions. In addition, labor organizations, if involved in a collaborative interaction with facility leaders, may also help emphasize the importance of influenza prevention strategies to protect both patients and HCP. Finally, facilities also should examine collective bargaining agreements and should anticipate including influenza vaccination requirements into renewed agreements. Such leadership represents a serious commitment to patient and HCP safety and should be valued as such.

CONCLUSIONS

Influenza vaccination of HCP is an important and key component of infection prevention programs designed to reduce healthcare-associated influenza. As with any core patient safety practice, low rates of compliance that place patients and HCP at risk are unacceptable. Because HCP influenza vaccination rates in the setting of voluntary programs have remained low over the nearly 3 decades that HCP influenza vaccination has been recommended, SHEA endorses policies that require influenza vaccination as a condition of employment as part of a comprehensive influenza infection control program.

APPROVAL AND ENDORSEMENT

This position paper has been approved by the Board of the Society of Healthcare Epidemiology of America and endorsed by the Infectious Diseases Society of America.

ACKNOWLEDGMENTS

We thank William Schaffner, MD, for his careful review of the manuscript.

Potential conflicts of interest. T.R.T. reports that he is a consultant for Joint Commission Resources, has received honoraria from GlaxoSmithKline through support of the Joint Commission Resources Flu Challenge Program, and has received research support from Sanofi Pasteur for donated Tdap vaccine for a CDC-funded study (his spouse has received research support from Wyeth, Vaxxinate, and Sanofi Pasteur). D.J.W. reports that he is a consultant for GlaxoSmithKline and has received honoraria from Wyeth, Pfizer, Merck, and OrthoMcNeil. E.J.S. reports that he is a consultant for BD Diagnostics and Rymed Technology and has received honoraria from Sage, Care Fusions, Merck, and Cubist. G.A.P. reports that he is a consultant to Merck, Avianax, Theraclone Sciences [formally Spaltudaq Corporation], MedImmune, Liquidia Technologies, Novavax, EMD Serono, Novartis Vaccines and Therapeutics, PaxVax, CSL, Emergent BioSolutions, and Glaxo-SmithKline, and has received research support from Wyeth and Novavax. M.L.T. reports that he is a consultant to Human Genome Sciences, Pfizer. All other authors report no conflicts of interest relevant to this article.

Address reprint requests to Thomas R. Talbot, MD, MPH, A-2200 Medical Center North, 1161 21st Ave South, Vanderbilt University Medical Center, Nashville, TN 37232 (tom.talbot@vanderbilt.edu).

REFERENCES

- Talbot TR, Bradley SE, Cosgrove SE, Ruef C, Siegel JD, Weber DJ. Influenza vaccination of healthcare workers and vaccine allocation for healthcare workers during vaccine shortages. *Infect Control Hosp Epidemiol* 2005;26(11):882–890.
- Interim within-season estimate of the effectiveness of trivalent inactivated influenza vaccine—Marshfield, Wisconsin, 2007–08 influenza season. *MMWR Morb Mortal Wkly Rep* 2008;57(15):393–398.
- Shugarman LR, Hales C, Setodji CM, Bardenheier B, Lynn J. The influence of staff and resident immunization rates on influenza-like illness outbreaks in nursing homes. *J Am Med Dir Assoc* 2006;7(9):562–567.
- van den Dool C, Bonten MJ, Hak E, Wallinga J. Modeling the effects of influenza vaccination of healthcare workers in hospital departments. *Vaccine* 2009;27(44):6261–6267.
- van den Dool C, Bonten MJ, Hak E, Heijne JC, Wallinga J. The effects of influenza vaccination of healthcare workers in nursing homes: insights from a mathematical model. *PLoS Med* 2008;5(10):e200.
- Burls A, Jordan R, Barton P, et al. Vaccinating healthcare workers against influenza to protect the vulnerable—is it a good use of healthcare resources? A systematic review of the evidence and an economic evaluation. *Vaccine* 2006;24(19):4212–4221.
- Chicaiza-Becerra LA, Garcia-Molina M, Ballesteros M, Gamboa O, Diaz J, Vega R. Economic evaluation of influenza vaccine applied to health personnel attending hospitalised oncological patients [in Spanish]. *Revista de Salud Publica (Bogota)* 2008;10(5):756–766.
- Carman WF, Elder AG, Wallace LA, et al. Effects of influenza vaccination of healthcare workers on mortality of elderly people in long-term care: a randomised controlled trial. *Lancet* 2000;355(9198):93–97.
- Potter J, Stott DJ, Roberts MA, et al. Influenza vaccination of healthcare workers in long-term care hospitals reduces the mortality of elderly patients. *J Infect Dis* 1997;175(1):1–6.
- Hayward AC, Harling R, Wetten S, et al. Effectiveness of an influenza vaccine programme for care home staff to prevent death, morbidity, and health service use among residents: cluster randomised controlled trial. *BMJ* 2006;333(7581):1241.
- Lemaitre M, Meret T, Rothan-Tondeur M, et al. Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster-randomized trial. *J Am Geriatr Soc* 2009;57(9):1580–1586.
- Thomas RE, Jefferson T, Lasserson TJ. Influenza vaccination for health-care workers who work with the elderly. *Cochrane Database Syst Rev* 2010;2:CD005187.
- Elder AG, O'Donnell B, McCrudden EA, Symington IS, Carman WF. Incidence and recall of influenza in a cohort of Glasgow healthcare workers during the 1993–4 epidemic: results of serum testing and questionnaire. *BMJ* 1996;313(7067):1241–1242.
- Weingarten S, Riedinger M, Bolton LB, Miles P, Ault M. Barriers to influenza vaccine acceptance: a survey of physicians and nurses. *Am J Infect Control* 1989;17(4):202–207.
- Bridges CB, Thompson WW, Meltzer MI, et al. Effectiveness and cost-benefit of influenza vaccination of healthy working adults: a randomized controlled trial. *JAMA* 2000;284(13):1655–1663.
- Nichol KL, Lind A, Margolis KL, et al. The effectiveness of vaccination against influenza in healthy, working adults. *N Engl J Med* 1995;333(14):889–893.
- Kane RL, Shamliyan T, Mueller C, Duval S, Wilt TJ. Nurse staffing and quality of patient care. *Evid Rep Technol Assess (Full Rep)* 2007;(151):1–115.
- Hugonnet S, Chevolet JC, Pittet D. The effect of workload on infection risk in critically ill patients. *Crit Care Med* 2007;35(1):76–81.
- Harris KM, Maurer J, Lurie N. Influenza vaccine use by adults in the USA: snapshot from the end of the 2008–2009 vaccination season. *Rand Health*. http://www.rand.org/pubs/occasional_papers/2009/RAND_OP270.pdf. Published 2009. Accessed February 19, 2010.
- Harris KM, Maurer J, Lurie N. Seasonal influenza vaccine use by adults in the US: a snapshot as of mid-November 2009. *Rand Health*. http://www.rand.org/pubs/occasional_papers/2009/RAND_OP289.pdf. Published 2009. Accessed February 19, 2010.
- Caban-Martinez AJ, Lee DJ, Davila EP, et al. Sustained low influenza vaccination rates in US healthcare workers. *Prev Med* 2010;50(4):210–212.
- Paper presented at: 42nd NIC National Immunization Conference—Mandatory Influenza Vaccination: The Virginia Mason Story, March 18, 2008; Atlanta, Georgia. http://cdc.confex.com/recording/cdc/nic2008/ppt/free/4db77adf5df9ff0d3caf5cafe28f496/paper15824_5.ppt. Accessed March 31, 2009.
- Rakita RM, Hagar BA, Crome P, Lammert JK. Mandatory influenza vaccination of healthcare workers: a 5-year study. *Infect Control Hosp Epidemiol* 2010;31(9):881–888.
- Babcock HM, Gemeinhart N, Jones M, Dunagan WC, Woeltje KF. Mandatory influenza vaccination of healthcare workers: translating policy to practice. *Clin Infect Dis* 2010;50(4):459–464.
- Cormier SB, Septimus E, Moody JA, Hickok JD, Perlin JB. Implementation of a successful seasonal influenza vaccine strategy in a large health-care system. In: Program and abstracts of Fifth Decennial International Conference on Healthcare-Associated Infections; March 20, 2010; Atlanta, Georgia. Abstract 385.
- Immunization Action Coalition Web site. Honor roll for patient safety. <http://www.immunize.org/honor-roll/>. Accessed August 18, 2010.
- New York Department of State, Codes, Rule, and Regulations: 10NYCRR 66–3. Accessed February 22, 2010.
- New York State Department of Health. Dear administrator letter: suspension of flu vaccine mandate for health care workers. http://www.nyhealth.gov/diseases/communicable/influenza/seasonal/providers/2009-10-23_suspension_of_mandatory_influenza_immunization.htm. Revised August 2009. Accessed February 22, 2010.
- Douville LE, Myers A, Jackson MA, Lantos JD. Healthcare worker knowledge, attitudes, and beliefs regarding mandatory influenza vaccination. *Arch Pediatr Adolesc Med* 2010;164(1):33–37.
- Poland GA, Ofstead CL, Tucker SJ, Beebe TJ. Receptivity to mandatory influenza vaccination policies for healthcare workers among registered nurses working on inpatient units. *Infect Control Hosp Epidemiol* 2008;29(2):170–173.
- deSante JE, Caplan A, Shofer F, Behrman AJ. Physician attitudes towards influenza immunization and vaccine mandates. *Vaccine* 2010;28(13):2517–21.

32. Lautenbach E, Saint S, Henderson DK, Harris AD. Initial response of health care institutions to emergence of H1N1 influenza: experiences, obstacles, and perceived future needs. *Clin Infect Dis* 2009;50(4):523–527.
33. American College of Occupational and Environmental Medicine (ACOEM) guidance statement: seasonal influenza prevention in health-care workers. <http://www.acoem.org/guidelines.aspx?id=5362>. Published 2010. Accessed March 31, 2009.
34. Lugo NR. Will carrots or sticks raise influenza immunization rates of healthcare personnel? *Am J Infect Control* 2007;35(1):1–6.
35. Anikeeva O, Braunack-Mayer A, Rogers W. Requiring influenza vaccination for healthcare workers. *Am J Public Health* 2009;99(1):24–29.
36. Helms CM, Polgreen PM. Should influenza immunisation be mandatory for healthcare workers? Yes. *BMJ* 2008;337:a2142.
37. Isaacs D, Leask J. Should influenza immunisation be mandatory for healthcare workers? No. *BMJ* 2008;337:a2140.
38. Steckel CM. Mandatory influenza immunization for healthcare workers—an ethical discussion. *AAOHN J* 2007;55(1):34–39.
39. Stewart AM. Mandatory vaccination of healthcare workers. *N Engl J Med* 2009;361(21):2015–2017.
40. Tilburt JC, Mueller PS, Ottenberg AL, Poland GA, Koenig BA. Facing the challenges of influenza in healthcare settings: the ethical rationale for mandatory seasonal influenza vaccination and its implications for future pandemics. *Vaccine* 2008;26(suppl 4):D27–30.
41. van Delden JJ, Ashcroft R, Dawson A, Marckmann G, Upshur R, Verweij ME. The ethics of mandatory vaccination against influenza for healthcare workers. *Vaccine* 2008;26(44):5562–5566.
42. Talbot TR. Do declination statements increase healthcare worker influenza vaccination rates? *Clin Infect Dis* 2009;49(5):773–779.
43. Ohio Administrative Code. Chapter 3701–14. Hospital DRG and performance measures reporting requirements. <http://www.odh.ohio.gov/ASSETS/F0A1E3A02E4D42B5BFF17B45AEEA53AD/FR14-04-ApdxB.pdf>. Accessed February 22, 2010.
44. “America’s Best Children’s Hospitals” 2010 methodology. US News and World Report. <http://static.usnews.com/documents/health/best-childrens-methodology.pdf>. Updated June 30, 2010. Accessed February 22, 2010.
45. Polgreen PM, Polgreen LA, Evans T, Helms C. A statewide system for improving influenza vaccination rates in hospital employees. *Infect Control Hosp Epidemiol* 2009;30(5):474–478.
46. Johnson DF, Druce JD, Birch C, Grayson ML. A quantitative assessment of the efficacy of surgical and N95 masks to filter influenza virus in patients with acute influenza infection. *Clin Infect Dis* 2009;49(2):275–277.
47. Aiello AE, Murray GF, Perez V, et al. Mask use, hand hygiene, and seasonal influenza-like illness among young adults: a randomized intervention trial. *J Infect Dis*;201(4):491–498.
48. Cowling BJ, Chan KH, Fang VJ, et al. Facemasks and hand hygiene to prevent influenza transmission in households: a cluster randomized trial. *Ann Intern Med* 2009;151(7):437–446.
49. Wicker S. Unvaccinated health care workers must wear masks during flu season—a possibility to improve influenza vaccination rates? *Vaccine* 2009;27(20):2631–2632.
50. IDSA policy on mandatory influenza immunization of healthcare workers. <http://www.idsociety.org/Content.aspx?id=14220>. Published 2009. Accessed January 19, 2010.
51. Bertin M, Scarpelli M, Proctor AW, et al. Novel use of the intranet to document healthcare personnel participation in a mandatory influenza vaccination reporting program. *Am J Infect Control* 2007;35(1):33–37.
52. Borlaug G, Newman A, Pfister J, Davis JP. Factors that influenced rates of influenza vaccination among employees of Wisconsin acute care hospitals and nursing homes during the 2005–2006 influenza season. *Infect Control Hosp Epidemiol* 2007;28(12):1398–1400.
53. Polgreen PM, Septimus EJ, Parry MF, et al. Relationship of influenza vaccination declination statements and influenza vaccination rates for healthcare workers in 22 US hospitals. *Infect Control Hosp Epidemiol* 2008;29(7):675–677.
54. Ribner BS, Hall C, Steinberg JP, et al. Use of a mandatory declination form in a program for influenza vaccination of healthcare workers. *Infect Control Hosp Epidemiol* 2008;29(4):302–308.
55. Buchta WG, Verdoon CA, Schultz GL. Effectiveness of declination statements in influenza vaccination programs for healthcare workers. In: Program and abstracts of the International Commission on Occupational Health (ICOH) Conference on Health Care Worker Health / 2007 State-of-the-Art Conference; October 26–28, 2007; Vancouver, British Columbia, Canada. Abstract 348217.
56. Polgreen PM, Chen Y, Beekmann S, et al. Elements of influenza vaccination programs that predict higher vaccination rates: results of an emerging infections network survey. *Clin Infect Dis* 2008;46(1):14–19.
57. Lindley MC, Yonek J, Ahmed F, Perz JF, Williams Torres G. Measurement of influenza vaccination coverage among healthcare personnel in US hospitals. *Infect Control Hosp Epidemiol* 2009;30(12):1150–1157.
58. Talbot TR, Dellit TH, Hebden J, Sama D, Cuny J. Factors associated with increased healthcare worker influenza vaccination rates: results of a national survey of university hospitals and medical centers. *Infect Control Hosp Epidemiol* 2010;31(5):456–462.
59. Omer SB, Salmon DA, Orenstein WA, deHart MP, Halsey N. Vaccine refusal, mandatory immunization, and the risks of vaccine-preventable diseases. *N Engl J Med* 2009;360(19):1981–1988.
60. Palmore TN, Vandersluis JP, Morris J, et al. A successful mandatory influenza vaccination campaign using an innovative electronic tracking system. *Infect Control Hosp Epidemiol* 2009;30(12):1137–1142.
61. Policy for mandatory seasonal influenza immunization for civilian health care personnel who provide direct patient care in Department of Defense military treatment facilities. <http://mhs.osd.mil/Content/docs/pdfs/policies/2008/08-005.pdf>. Published April 4, 2008. Accessed February 19, 2010.
62. APIC position paper: influenza immunization of healthcare personnel. http://www.apic.org/AM/Template.cfm?Section=Search§ion=Position_Statements1&template=/CM/ContentDisplay.cfm&ContentFileID=11049. Published October 1, 2008. Accessed June 2, 2009.
63. National Patient Safety Foundation. National Patient Safety Foundation supports mandatory flu vaccinations for healthcare workers. <http://www.npsf.org/pr/pressrel/2009-11-18.php>. Published November 18, 2009. Accessed January 19, 2010.