

Requiring influenza vaccination for health care workers: seven truths we must accept

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Abstract

In this paper we outline the seven primary truths supporting the call for requiring influenza immunization of all health care workers. We view this as a serious patient safety issue, given the clear and compelling data regarding the frequency and severity of influenza infection. In addition, clear-cut safety, efficacy, economic, legal, and ethical platforms support the use of influenza vaccine. Unfortunately health care workers have demonstrated, over almost 25 years that they are unwilling to comply with voluntary influenza immunization programs utilizing a variety of education and incentive programs, at rates sufficient to protect the patients in their care. We suggest that an annual influenza immunization should be required for every health care worker with direct patient contact, unless a medical contraindication or religious objection exists, or an informed declination is signed by the health care worker. High rates of health care worker immunization will benefit patients, health care workers, their families and employers, and the communities within which they work and live.

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1. Introduction

Influenza causes worldwide yearly epidemics resulting in 250,000–500,000 deaths [1]. The most efficient method of preventing these annual outbreaks and resulting morbidity and mortality is by the use of pre-exposure immunization. Because those most vulnerable to the complications of influenza, including death, congregate around health care workers by virtue of attending clinics, hospitals, and offices, an important method to decrease exposure to those most vulnerable is to immunize health care workers. The Centers for Disease Control and Prevention (CDC) has recommended influenza vaccination for all health care workers since 1981. Since that time, health care organizations across the country have established voluntary programs to provide influenza vaccine to health care workers in order to protect the lives and health

of their patients. The response thus far has been dismal, as only 36% of US health care workers received influenza vaccination in 2002 [2]. Even among health care centers utilizing highly organized and aggressive campaigns to promote immunization of health care workers, 30–50% remain unvaccinated. After more than two decades of voluntary trial and error programs, the time has come to take the next step in addressing this public health challenge by requiring influenza immunization of all health care workers. Here, we provide the data and rationale for such a requirement. We suggest that an annual influenza vaccine should be required for every health care worker with direct patient care activities, unless a medical contraindication to influenza immunization exists, a religious objection to immunization exists, or an informed declination is signed by the health care worker. This is identical to the highly successful method utilized in the hepatitis B immunization requirement for health care workers.

Since the initial Centers for Disease Control and Prevention (CDC) recommendation, the scientific understanding of

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influenza, the influenza vaccine, and the data on the efficacy of influenza immunization support the assertion that immunizing health care workers safely and effectively prevents a significant number of influenza infections, hospitalizations, and deaths among the patients they care for, as well as preventing workplace disruption and medical errors by workers absent from work due to illness, or present at work, but ill [3–7]. It is now undeniable that influenza vaccination of health care workers does result in improved patient safety, improved employee safety, and decreased health care expenditures [6,7]. In this paper, we provide the data for these assertions and put forward the proposal that the medical community has a moral imperative to take appropriate action to protect the vulnerable patients for whom they care, their fellow health care workers, and the public at large. With voluntary health care worker vaccination programs failing to achieve acceptable immunization rates [8], the data lead us to conclude that requiring influenza immunization of health care workers is a moral imperative. If the medical community is unable to overcome the inertia of the current policy that endangers the public, the medical community may lose control of the ability to make this choice.

We suggest that the medical, legislative, and public views of this health threat would likely be different if we were discussing a more exotic virus having the same transmissibility and morbidity as influenza. If we had a safe and effective vaccine against a newly emerging infection such as SARS or avian influenza, would we allow health care workers to care for infected patients without having received the vaccine? Conversely, would we allow infected health care workers to care for uninfected patients? In fact, concerns about the ethics of such behavior would surface almost immediately. Yet, we allow precisely these situations to occur with a virus that kills 36,000 Americans every year—the equivalent of a September 11, 2001 World Trade Center disaster every month of every year [9]. This is a horrific carnage that pales, however, to the 250,000–500,000 persons lost to this virus every year worldwide. Although we recognize that there are differing opinions regarding the appropriate policy regarding the issue of health care workers and influenza vaccine, we must acknowledge seven truths emerge from decades of research. Together they form a platform on which we can firmly stand and contend that we should require influenza vaccines for all health care workers.

2. The first truth: influenza infection is a serious illness causing significant morbidity and mortality adversely affecting the public health on an annual basis

Influenza is the sixth leading cause of death among adults in the United States, killing an average of 36,000 Americans annually [9]. Influenza kills as many or more Americans each year than breast cancer (40,000), and three times as many as HIV/AIDS (14,000) [9–11]. Influenza is related to 1 out of

every 20 deaths in the US among those older than 65 years of age. Overall, nearly 1 out of every 10,000 Americans will die of influenza and its complications this winter [2,12]. In addition, influenza causes enormous and unnecessary annual health care expenditures affecting the global economy. For example, the estimated annual direct cost of influenza infection in the United States is estimated to be between 3 and 5 billion dollars [13].

3. The second truth: influenza-infected health care workers can transmit this deadly virus to their vulnerable patients

Complications of nosocomial influenza are particularly burdensome on the elderly, the immunocompromised, critically ill patients, and young children—the very populations congregated in hospitals and medical clinics [2,9,14,15]. Influenza infection in these populations can often result in severe, prolonged, devastating illness, death, increased length of stay, and added costs [14,16]. The virus can be transmitted to patients and other employees by both symptomatic and asymptomatic health care workers—hence, simply “staying home from work” is an insufficient strategy for preventing nosocomial transmission [16,17]. Worse yet, multiple studies that have shown that health care workers continue to work despite being ill with influenza, increasing exposure of patients and coworkers [3,18,19]. Numerous reports of hospital influenza outbreaks exemplify the risk. In an influenza A, outbreak in a neonatal intensive care unit in 1998, 19 of the 54 patients on the ward tested positive for influenza A [20]. Of these 19, 6 were symptomatic and 1 died. In a survey of the 150 medical staff involved during the outbreak, only 15% had received the influenza vaccination including 67% of physicians and 9% of nurses. Only 29% of staff with symptomatic influenza took time off from work. Another outbreak the same year in another bone marrow transplant unit illustrates the devastation that a hospital outbreak can have on its most vulnerable patients. Of the 25 confirmed cases of nosocomial pneumonia in the hospital, 40% were in the BMT ward, 2 of which died [21]. Surveys during this outbreak revealed a 12% vaccination rate among health care workers on the unit. The following influenza season, despite of an aggressive eight-pronged, but voluntary education program, 42% of health care workers on the bone marrow transplant unit still failed to receive influenza vaccine.

Conversely, influenza immunization of health care workers protects vulnerable patients, improves patient safety, and can significantly decrease patient morbidity and mortality. A Scottish study compared mortality rates between long-term care hospitals that offered influenza vaccination to health care workers, where 51% were vaccinated, and hospitals that did not, where only 5% were vaccinated [7]. The result was nearly a 40% reduction in all-cause mortality among the patients cared for by the health care workers in the hospitals with higher levels of health care worker influenza vaccination. No

wonder that the National Quality Forum, a voluntary consensus health care standard-setting organization in the US, has listed influenza immunization of health care workers as 1 of 30 safe practices that should be used universally to reduce the risk of harm to patients [22].

4. The third truth: influenza vaccination of health care workers saves money for employees and employers and prevents workplace disruption

Nichol et al. [6] reported that healthy working adults who receive influenza vaccination have 25% fewer upper respiratory infections, 44% fewer doctor visits, and 43% fewer sick days off, saving an average of \$47 per person annually. A previous study by Nichol et al. [23] revealed that among three different cohorts of 25,000 adults each studied over 3 years, influenza vaccination reduced pneumonia and influenza hospitalizations by 48–57%, all acute and chronic respiratory conditions by 27–39%, and all cause mortality by 39–54%. This resulted in a direct savings per year averaging \$117 per person immunized [23].

With the majority of health care workers not receiving influenza vaccination, influenza epidemics frequently result in staffing problems in clinics and hospitals across the country. To assess the impact of influenza on acute care hospitals, the CDC conducted a web-based survey of hospital epidemiologists in 221 institutions from all regions in the US from December 2003 to February 2004 (unpublished data presented at the ACIP meeting, February 2004, Atlanta, GA). In this survey, 35% of hospitals reported staffing shortages during the peak influenza epidemic. Furthermore, 28% reported bed shortages, 43% reported ICU bed shortages, and 9% reported diversion of patients to other care facilities for a mean of 6 days. Although health care organizations have been concerned about the cost of vaccinating their employees, the costs of not doing so are much higher, and the end result is a net cost benefit and a safer environment for patients.

5. The fourth truth: influenza vaccination of health care workers is already recommended by the CDC and is the standard of care

This recommendation has been in place by the Centers for Disease Control and Prevention since 1981. Since that time, hospitals, clinics, and health organizations have developed influenza immunization programs and have devoted resources to it. However, these programs are passive, voluntary systems that fail to recognize the current data and realities [24]. The result is a failed and incomplete system reaching an average of only 36% of US health employees annually [2]. Voluntary health care worker influenza immunization, although improved over the last several decades, remains unacceptably low [8]. Voluntary immunization programs in the US have never resulted in high immunization rates for any age,

in any setting, for any disease, in any location, at any time, in any age group, for any reason. Voluntary immunization programs simply do not result in high and sustained levels of vaccine coverage. Because of the serious consequences related to nosocomial influenza outbreaks as well as the impact on health care workers and the economic impact on health care systems, it is an imperative that action be taken to improve health care worker vaccination rates. Voluntary programs have not succeeded in attaining acceptable immunization rates, and there is no reason to think they will do so in the near future. It is necessary to develop new programs or legislation requiring influenza vaccination for all health care workers.

6. The fifth truth: immunization requirements are effective and work in increasing vaccination rates

A requirement for vaccination is not unique to influenza. Childhood immunization rates vastly improved in the US, often exceeding 90–95%, once mandatory school-entry immunization requirements were put into place. In health care settings, mandating hepatitis B vaccination and rubella vaccination has also been successful in achieving nearly universal immunization of health employees against these pathogens. Similarly, health care worker requirements for measles, mumps, varicella, and annual screening for tuberculosis, have worked and result in improved patient safety. Although there is concern that an influenza immunization requirement would be met with resistance, other vaccine mandates have been widely accepted. We believe that requiring influenza vaccination for health care workers would similarly be highly effective and, perhaps with additional education, widely accepted.

7. The sixth truth: health care workers and health care systems have an ethical and moral duty to protect vulnerable patients from transmissible diseases

The Occupational Safety and Health Agency and the Joint Commission on Accreditation of Healthcare Organizations have supported the idea of protecting health care workers and the patients they care for by pursuing vaccination initiatives as well as other measures to protect all involved. Beyond government interventions, the medical community has an ethical obligation to act with the safety of its patients as its foremost interest. It is now known that health care workers are vectors for the spread of influenza to vulnerable patients whom the disease would most jeopardize. It is also known that influenza vaccination of health care workers protects patients from influenza infection and decreases mortality. Finally, the vaccine is safe. Knowing these facts and not acting upon them with a comprehensive, effective, expeditious, and reasonable manner is a dereliction of the responsibilities of the medical

community to the safety of the public whose care they are entrusted with.

8. The seventh truth: the health care system will either lead or be lambasted

Health organizations must take responsibility for curbing yearly epidemics that profoundly influence the health of our patients, our health care workers, our communities, and our global health. The US health care system has largely remained self-governing with regard to many health policies. With the recognition that voluntary health care worker immunization programs achieve only dismal vaccination rates among health care workers, the medical community should take decisive action. To make an influenza vaccination requirement a reality, health care organizations must set aside unfounded fears, preconceptions, and misconceptions about influenza, the influenza vaccine, and the response of health care workers to such a mandate. Clear and unambiguous data supporting the truths about influenza immunization render a vaccination requirement a necessity. If the medical community is unable to overcome the inertia of a policy that has been failing for decades, then the inevitable outcomes will be realized. Reports of nosocomial influenza outbreaks have already started to surface in the popular media, making the headlines of major newspapers last influenza season. As these reports become widely disseminated and as the public becomes aware that health care workers are largely unvaccinated, the health care system will lose trust and credibility. Once this is the case, the ability of the medical community to make its own policy decisions may be diminished, with the duty instead falling to enforcement organizations and legislative policy makers.

Some health organizations have already taken the initiative to protect the patients under their care. Virginia Mason Medical Center in Washington has recently instituted an influenza vaccination requirement for all its workers. In addition, seven US states including Alabama, Arkansas, Kentucky, Maine, Maryland, New Hampshire, Pennsylvania, and Rhode Island have enacted various influenza immunization mandates for health care workers in long-term care facilities and occasionally in acute care hospitals, allowing for appropriate exemptions [25–27]. The province of Ontario now mandates influenza immunization of all health care workers. But, we make it difficult for individual organizations and local governments by forcing piecemeal solutions. We need national and international initiatives and policies to make such a requirement a reality.

There are many financial, structural, and attitudinal obstacles that have been suggested as barriers to implementation of universal influenza immunization of health care workers. One concern is that doing so would be prohibitively expensive. But, after the initial costs of purchasing, advertising, and delivering the vaccine, health care systems would quickly realize the cost savings of decreased employee health care vis-

its, days of missed work due to illness, and decreased medical errors committed by ill employees [6]. Another concern is that influenza vaccination would be too difficult to implement every year. There are a variety of annual mandates for health care worker and patient safety programs such as tuberculosis exposure testing, medical licensure, infection control, and safety videos. An influenza vaccination requirement could be done in conjunction with these other requirements and would thus be unlikely to impose a significantly increased burden.

Some barriers would have to be overcome to implement an influenza vaccination requirement. For those with contraindications to the vaccine, a method of informed declination would be necessary. Even with a small percentage of individuals unable to be vaccinated, the phenomenon of herd immunity would continue to protect unimmunized health care workers and their patients. Employee resistance to an immunization mandate is an attitudinal barrier that would need to be overcome. Judging by the experience with other vaccine mandates, the extent of this would be minimal. Nonetheless, education campaigns regarding the need, the safety, and the efficacy of influenza vaccination would be valuable to further inform health employees of the reasons for the policy and to engage their cooperation. It is our prediction that in the years to come the medical profession will look back with chagrin that such a requirement was not put into place until well into the 21st century.

The medical community is now armed with clear and unambiguous data demonstrating that health care workers are vectors in nosocomial influenza outbreaks as well as data proving that influenza vaccination is safe, effective, cost efficient, and successful in reducing patient morbidity and mortality. The current policy of voluntary vaccination of health care workers is not effective in achieving acceptable immunization rates and thereby endangers the vulnerable patients we care for and are entrusted with. Requiring influenza vaccination of health care workers is the right thing to do. It benefits the patient, the employee, and the employer. The health profession has the opportunity to demonstrate that we can and will do the right thing for our patients and thereby reassert our national leadership role and engender trust and credibility among the public.

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References

- [1] World Health Organization. Influenza Fact Sheet N211, available at: <http://www.who.int/mediacentre/factsheets/2003/fs211/en/print.html>; 2004 [accessed November].
- [2] Harper SA, Fukuda K, Uyeki TM, Cox NJ, Bridges CB. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2004;53:1–40.
- [3] Wilde JA, McMillan JA, Serwint J, Butta J, O’Riordan MA, Steinhoff MC. Effectiveness of influenza vaccine in health care professionals. A randomized trial. *JAMA* 1999;281:908–13.
- [4] Bridges CB, Thompson WW, Meltzer MI, Reeve GR, Talamonti WJ, Cox NJ, et al. Effectiveness and cost-benefit of influenza vaccination of healthy working adults: A randomized controlled trial. *JAMA* 2000;284:1655–63.
- [5] Demicheli V, Jefferson T, Rivetti D, Deeks J. Prevention and early treatment of influenza in healthy adults. *Vaccine* 2000;18:957–1030.
- [6] Nichol KL, Lind A, Margolis KL, Murdoch M, McFadden R, Hauge M, et al. The effectiveness of vaccination against influenza in healthy, working adults. *N Engl J Med* 1995;333:889–93.
- [7] Carman WF, Elder AG, Wallace LA, McAulay K, Walker A, Murray GD, et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomised controlled trial. *Lancet* 2000;355:93–7.
- [8] National Foundation for Infectious Diseases. Influenza immunization among health care workers. Call to action. Improving dismal influenza vaccination rates among health care workers requires comprehensive approach, institutional commitment, available at: <http://www.nfid.org/publications>; 2004 [accessed November, report].
- [9] Thompson WW, Shay DK, Weintraub E, Brammer L, Cox N, Anderson LJ, et al. Mortality associated with influenza and respiratory syncytial virus in the United States. *JAMA* 2003;289:179–86.
- [10] Centers for Disease Control and Prevention. A glance at the HIV epidemic. CDC HIV/AIDS Update, available at: www.cdc.gov/nchsto/od/news/At-a-Glance.pdf; 2004 [accessed November].
- [11] American Cancer Society. Cancer facts & figures, available at: http://www.cancer.org/docroot/STT/stt_0.asp; 2004 [accessed November].
- [12] Thompson WW, Shay DK, Weintraub E, Brammer L, Bridges CB, Cox NJ, et al. Influenza-associated hospitalizations in the United States. *JAMA* 2004;292:1333–40.
- [13] Doebbeling BN, Edmond MB, Davis CS, Woodin JR, Zeitler RR. Influenza vaccination of health care workers: evaluation of factors that are important in acceptance. *Prev Med* 1997;26:68–77.
- [14] Salgado CD, Farr BM, Hall KK, Hayden FG. Influenza in the acute hospital setting. *Lancet Infect Dis* 2002;2:145–55.
- [15] Stott DJ, Kerr G, Carman WF. Nosocomial transmission of influenza. *Occup Med (Lond)* 2002;52:249–53.
- [16] 2004 APIC Immunization Practices Working Group, Dash G.P, Fauerbach L, et al. APIC position paper: improving health care worker influenza immunization rates. *Am J Infect Control* 2004;32:123–5.
- [17] LaForce FM, Nichol KL, Cox NJ. Influenza: virology, epidemiology, disease, and prevention. *Am J Prev Med* 1994;10:31–44.
- [18] Lester RT, McGeer A, Tomlinson G, Detsky AS. Use of, effectiveness of, and attitudes regarding influenza vaccine among house staff. *Infect Control Hosp Epidemiol* 2003;24:839–44.
- [19] 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;17:202–7.
- [20] Cunney RJ, Bialachowski A, Thornley D, Smaill FM, Pennie RA. An outbreak of influenza A in a neonatal intensive care unit. *Infect Control Hosp Epidemiol* 2000;21:449–54.
- [21] Weinstock DM, Eagan J, Malak SA, Rogers M, Wallace H, Kiehn TE, et al. Control of influenza A on a bone marrow transplant unit. *Infect Control Hosp Epidemiol* 2000;21:730–2.
- [22] Kizer KW. The National Quality Forum: safe practices for better healthcare. A consensus report, 2004.
- [23] Nichol KL, Margolis KL, Wuorenma J, Von Sternberg T. The efficacy and cost effectiveness of vaccination against influenza among elderly persons living in the community. *N Engl J Med* 1994;331:778–84.
- [24] Evans ME, Hall KL, Berry SE. Influenza control in acute care hospitals. *Am J Infect Control* 1997;25:357–62.
- [25] Anonymous 1999; History, Acts 1999, No. 1524 [bill/resolution].
- [26] The General Assembly of Pennsylvania 2001; 846 P.N. 2587 [bill/resolution].
- [27] State of New Hampshire 2004; Senate Bill 438-2004 Session [bill/resolution].