



ELSEVIER

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)

## Original Research Article

## Association of increased influenza vaccination in health care workers with a reduction in nosocomial influenza infections in cancer patients

Elizabeth Frenzel MD, MPH<sup>\*</sup>, Roy F. Chemaly MD, MPH, Ella Ariza-Heredia MD, Ying Jiang MS, Dimpy P. Shah MD, MSPH, PhD, Georgia Thomas MD, MPH, Linda Graviss MT, CIC, Issam Raad MD

Department of Infectious Diseases, Infection Control, and Employee Health, The University of Texas MD Anderson Cancer Center, Houston, TX

**Key Words:**  
Influenza  
vaccination  
health care workers  
cancer  
nosocomial infection

**Background:** Vaccination of health care workers (HCWs) remains a key strategy to reduce the burden of influenza infections in cancer patients.

**Methods:** In this 8-year study, we evaluated the effect of a multifaceted approach, including a mandatory influenza vaccination program, on HCW vaccination rates and its effect on nosocomial influenza infections in cancer patients.

**Results:** The influenza vaccination rate of all employees significantly increased from 56% (8,762/15,693) in 2006–2007 to 94% (17,927/19,114) in 2013–2014 ( $P < .0001$ ). The 2009 mandatory participation program increased HCW vaccination rates in the targeted groups ( $P < .0001$ ), and the addition of an institutional policy in 2012 requiring influenza vaccination or surgical mask use with each patient contact further increased vaccination rates by 10%–18% for all groups in 1 year. The proportion of nosocomial influenza infections significantly decreased ( $P = .045$ ) during the study period and was significantly associated with increased HCW vaccination rates in the nursing staff ( $P = .043$ ) and in personnel working in high-risk areas ( $P = .0497$ ).

**Conclusions:** Multifaceted influenza vaccination programs supported by institutional policy effectively increased HCW vaccination rates. Increased HCW vaccination rates were associated with a reduction in the proportion of nosocomial influenza infections in immunocompromised cancer patients.

© 2016 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

All cancer patients, particularly those with hematologic malignancies or recipients of hematopoietic cell transplant, are susceptible to community respiratory viruses, such as influenza. These patient populations have significant mortality rates (range, 15%–28%) after the influenza infection progresses to a lower respiratory tract infection or after respiratory superinfections develop.<sup>1,2</sup> Antiviral therapy is available for influenza infections, but prevention remains the cornerstone to protect these susceptible immunocompromised patients.<sup>3</sup> Influenza vaccination in health care workers (HCWs) is viewed as a core patient and HCW safety practice to reduce the risk of infection and prevent nosocomial transmission of influenza to patients and has been associated with reduced patient mortality.<sup>4</sup>

The University of Texas MD Anderson Cancer Center is a 656-bed National Cancer Institute–designated comprehensive cancer center with >19,000 employees. In 2006, Employee Health (EH) at our institution conducted a detailed analysis of employee influenza vaccination rates to determine the vaccination status of employees working in patient care areas. We found vaccination rates of 47% in HCWs caring for our immunocompromised or high-risk patients and 41% for HCWs in the inpatient nursing units; both of these rates were markedly lower than the overall employee vaccination rate (56%). Subsequently, interventions, including a mandatory influenza vaccination program, were implemented to increase the vaccination rate among our employees. These interventions particularly targeted HCWs, including nurses caring for high-risk patients and the nursing staff in general because the latter group had the most frequent and prolonged contact with our immunocompromised patient population. We evaluated the outcomes of these strategies to increase influenza vaccination rates in HCWs and assessed the effect of these strategies on nosocomial influenza infections in our patients with cancer.

<sup>\*</sup> Address correspondence to Elizabeth Frenzel, MD, MPH, Department of Infectious Diseases, Infection Control, and Employee Health, Unit 1610, The University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd., Houston, TX 77030.

E-mail address: [efrenzel@mdanderson.org](mailto:efrenzel@mdanderson.org) (E. Frenzel).

Conflicts of Interest: None to report.

## PATIENTS AND METHODS

### *Employee influenza vaccination program*

In 2006, our baseline year, the employee influenza vaccination program consisted of large, on-site influenza vaccination clinics that were distributed throughout >20 geographically dispersed patient care areas and research and administration buildings and were supplemented by 1 week of roaming vaccination services via mobile carts to patient care areas. Records of employee influenza vaccination were collected using paper sign-in sheets. In 2007, EH initiated strategies to increase influenza vaccination rates in HCWs who had direct contact with our high-risk immunocompromised patients (eg, hematopoietic stem cell transplant recipients, patients with hematologic malignancies) and in all clinical nursing staff in the inpatient nursing units. Efforts centered on expanding access, education, and communication for influenza vaccination among HCWs.

To increase access, we implemented several strategies. All influenza vaccination clinics were relocated to the main hospital complex. Roaming service hours were increased from 30 to >100 hours, enhancing easy access to vaccinations in busy patient care areas. We also increased the number of on-site clinics and the scheduled clinic hours to >100 hours to improve access to vaccination opportunities during all work shifts.

We expanded our education and communication campaign by prominently advertising the expanded clinic schedule and centralized, hospital-based locations and distributing various educational materials on the safety and efficacy of influenza vaccination. We communicated with HCWs via all-employee e-mails, our institutional Web site, employee bulletin boards, and presentations at institutional meetings. Additionally, EH partnered with the infection control team to provide on-site vaccinations following their respiratory virus season in-services to inpatient areas as part of their preventive strategies to reduce nosocomial transmission. A mechanism for efficient on-site data entry of influenza vaccinations into an electronic medical record was developed, facilitating queries of vaccination rates and the ability to provide weekly updates of vaccination rates to supervisors and senior management.

Furthermore, in 2009, we piloted the mandatory participation influenza prevention program, which targeted HCWs in high-risk areas and in the nursing staff as subsequently defined. Program compliance was defined as one of the following: receiving an influenza vaccination from EH, providing documentation of vaccination by an outside provider, or signing a waiver-declination form. The waiver-declination form allowed for medical and personal belief exemptions and informed HCWs of the risk to our immunocompromised patients and to themselves posed by their declining vaccination. Weekly compliance updates were sent to managers and supervisors, and a final noncompliance list was sent to our executive leaders. In 2010, the program expanded to include all clinical operations employees; Patient care facilities employees with direct patient contact were added in 2011. In 2011, a compliance sticker was placed on institutional identification badges as visual confirmation of influenza vaccination.

In 2011, a new state law in Texas required health care facilities to implement a vaccine-preventable diseases policy. This legislative directive enabled us to develop and implement an institutional policy in 2012 for a mandatory vaccination program requiring all HCWs, including employees, contractors, trainees, and volunteers, either to receive influenza vaccination or to wear a surgical mask when caring for patients during the respiratory virus season. Compliance with mask use for unvaccinated HCWs was the responsibility of supervisors in each clinical area and was documented in a vaccine-preventable diseases policy compliance-monitoring database. Failure

to comply with this policy could result in disciplinary action, including termination.

### *HCW groups*

HCWs in high-risk areas included all employees working in the departments of stem cell transplantation and cellular therapy, leukemia, lymphoma and myeloma, infectious diseases, and pulmonary medicine and in the division of pediatrics, the division of anesthesiology and critical care, and emergency center areas.

Nursing staff included all inpatient nurses and affiliated nursing staff.

The clinical operations group, of which the high-risk areas and the nursing staff are subgroups, included all employees reporting to the physician-in-chief, providing direct patient care, providing hospital ancillary services, or providing administrative support. These employees are located in the main hospital complex and have a high likelihood of patient contact or have consistent interaction with HCWs who provide direct patient care.

The patient care facilities group consisted of housekeeping employees with direct patient contact; these employees are responsible for cleaning inpatient rooms and surroundings or outpatient clinic facilities.

### *Influenza surveillance*

All year round, screening for respiratory viruses via nasal washes was performed on all patients, in both the inpatient and outpatient settings, who had at least 2 of the following symptoms: fever, muscle aches, headache, cough, sore throat, sinus congestion, or runny nose. This surveillance program was in place during the entire 8-year study period.

Respiratory virus screening via the rapid shell vial culture technique was performed on all specimens during the study period. The first reading of the shell vials occurred between 15 and 24 hours, and the final reading was taken at 48 hours. All vials were read and developed at appropriate times, and results were confirmed using immunofluorescent staining. Hemadsorption was performed on days 2, 5, and 7. Both pool and individual reagents were used containing monoclonal antibodies to adenovirus, influenza A, influenza B, parainfluenza 1-4, and respiratory syncytial virus (Light Diagnostics 3105 and 3108; EMD Millipore, Billerica, MA). Direct fluorescent antibody tests were also performed for detecting influenza, parainfluenza, metapneumovirus, and respiratory syncytial virus antigens in respiratory samples (Light Diagnostics/SimulFluor RSV/Flu A, 3129; EMD Millipore).

Nosocomial influenza infection was defined as a laboratory-confirmed diagnosis of influenza in a patient admitted >48 hours (average time of the incubation period of this virus which is between 1 and 4 days) before the onset of symptoms. Once a respiratory viral diagnosis is suspected based on symptoms or microbiologically confirmed, the patient is placed on contact isolation precautions with a mask, and not only on droplet isolation as recommended, to provide an additional barrier for horizontal transmission.

### *Infection control measures*

During the influenza season, signage is prominently displayed throughout the institution to remind patients, family members and caregivers, and institutional workforce members to cover their cough, perform hand hygiene often, and refrain from touching mucous membranes (eg, eyes, nose, mouth) with their hands. All patients, family members, and visitors are screened for signs and symptoms of upper respiratory illness. Those identified with the respiratory illness receive a supply of masks to wear while inside

Download English Version:

<https://daneshyari.com/en/article/5566700>

Download Persian Version:

<https://daneshyari.com/article/5566700>

[Daneshyari.com](https://daneshyari.com)