

# Flu Vaccination Rates Tied to Hospital Practices

BY DOUG BRUNK

SAN DIEGO — Health care worker influenza vaccination programs with high coverage rates emphasized accountability to the highest levels of the organization, provided weekend access to the vaccine, and used train-the-trainer programs, a survey of 50 hospitals showed.

The researchers found surprising variation from hospital to hospital in the definition of health care worker. "A uniform definition of health care worker is essential if and when health care worker vaccination rates are reported publicly," lead investigator Dr. Thomas R. Talbot said at the annual meeting of the Society for Healthcare Epidemiology of America.

In August and September of 2008, he and his associates sent a 45-question survey about health care worker vaccination practices to 50 hospitals in 33 states that were members of the University Health-System Consortium, a group of academic medical centers that conducts multiple benchmarking studies each year. The 50 hospitals ranged in size from

2,603 to 26,000 health care workers and represented a total of 368,969 health care workers, said Dr. Talbot, chief hospital epidemiologist at Vanderbilt University, Nashville, Tenn.

Nearly all vaccination programs (98%) included nursing staff, but only 68% targeted attending and faculty physicians, 54% included volunteers, 46% included agency staff, and 34% included medical students. Although 94% of hospitals tracked health care worker vaccination rates, the remainder tracked the number of doses of vaccine administered.

Of all health care workers at the hospitals surveyed, 57% were vaccinated during the 2007-2008 influenza season. The rate per facility ranged from 26% to 81%.

The vaccine was provided free of charge to all employees at all sites. It was also provided at no charge to 96% of volunteers, 62% of students, 60% of visiting health care workers, and 14% of employee family members.

Reported times and locations where the influenza vaccine was provided included clinical units (96%), satellite facilities

(92%), at group meetings (92%), on night shifts (90%), and on weekends (78%). In addition, 76% of the hospitals used mo-



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DR. TALBOT

bile carts, 70% had a train-the-trainer program, 34% provided incentives or raffles for prizes, and 18% rewarded units or areas with high vaccination rates.

More than one-third of hospitals (38%) require health care workers who refuse vaccination to formally decline vaccination. Of those, 79% require a signed declination form.

The majority of hospitals (82%) report their vaccination rates to facility administrators, and 62% provide them to department chairs or service chiefs, but

only 20% provide them to the hospital board of trustees.

None of the hospitals reported that they had ever dismissed an employee because of failure to follow the facility's influenza vaccination policy.

Two-thirds of hospitals (66%) reported that administrators send a letter or communication to their health care workers emphasizing the importance of the influenza vaccination campaign.

Certain vaccination program components were associated with significantly higher vaccination rates when compared with hospitals that did not use such components. These included provision of vaccine on weekends (59% vs. 44%), use of train-the-trainer programs (60% vs. 47%), report of vaccination coverage rates to the hospital board of trustees (64% vs. 53%), and visible support from hospital administrators (58% vs. 37%), such as administration sending a letter to health care workers emphasizing the importance of influenza vaccination.

Dr. Talbot disclosed that he has received research funding from Sanofi Pasteur. ■

## Hospital-Acquired Pneumonia Risk Tied to Acid-Suppressive Medications

BY DAMIAN McNAMARA

MIAMI BEACH — Acid-suppressive medication is associated with a 30% increased risk of hospital-acquired pneumonia compared with nonexposure, according to a recent report.

"These medications are potentially responsible for 180,000 excess cases of hospital-acquired pneumonia annually," lead investigator Dr. Shoshana J. Herzig commented at the annual meeting of the Society of General Internal Medicine. "We believe these should be used more judiciously" than they are currently used in the non-ICU population.

Proton pump inhibitors were significantly associated with an increased risk of pneumonia, but histamine<sub>2</sub> receptor blockers were not.

In U.S. hospitals, an estimated 40%-70% of inpatients receive acid-suppressive medication (ASM). In about half the cases, ASM therapy is prescribed for the first time while the patient is in the hospital (Ann. Pharmacother. 2006;40:1261-6; Am. J. Gastroenterol. 2000;95:3118-22). Prophylaxis of stress ulcers in low-risk patients is a common reason these agents are ordered (Am. J. Gastroenterol. 2006;101:2200-5).

In the current study, up to 70% of the indications for ASMs were not well investigated or supported by the literature, Dr. Herzig and her associates reported (JAMA 2009;301:2120-8).

Other studies have suggested that the risk of community-acquired pneumonia is increased among people taking ASMs in an outpatient setting (Ann. Intern. Med. 2008;149:391-8; Arch. Intern. Med. 2007;167:950-5).

Dr. Herzig and her associates found that more than half of 63,787 non-ICU admissions to Beth Israel Deaconess Medical Center in Boston from January 2004 to December 2007 had an order for a proton-pump inhibitor (PPI) and/or a histamine<sub>2</sub> receptor blocker. Of these admissions,

2,219 (3.5%) later had an ICD-9 code for bacterial pneumonia as a secondary discharge diagnosis, said Dr. Herzig, chief medical resident and general medicine fellow at the hospital.

Inpatients who received an ASM had a higher rate of hospital-acquired pneumonia, 4.9%, compared with 2.0% of unexposed patients (unadjusted odds ratio, 2.6). The adjusted odds ratio was 1.3, indicating a 30% higher risk associated with this practice, based on a multivariable analysis that controlled for 50 possible confounders and comorbidities.

"We found PPIs, in particular, were associated with increased risk," Dr. Herzig said. This association was significant (OR, 1.3), but an order for a histamine<sub>2</sub> receptor blocker was not (OR, 1.1).

Why ASM agents, and especially PPIs, are associated with a higher risk of pneumonia is unknown. Dr. Herzig and her coworkers hypothesized that impairment of white blood cell function might play a role.

The mean age of the study population was 54 years; men comprised 37% of the cohort. Inpatients prescribed an ASM were more likely to be male, to be older, and to have heart disease or diabetes. Taking these factors into account, Dr. Herzig and her associates did a validation study and found the same higher risk of hospital-acquired pneumonia (adjusted OR, 1.3) in 16,396 patients with an ASM order, compared with 16,396 demographically similar unexposed patients.

The generalizability of the findings may be limited by the fact that the study was conducted at a single large urban medical center. Results should be validated at other institutions, she said.

Dr. Herzig and her associates did not disclose any conflicts of interest. The study was funded through a grant from the Department of Health and Human Services that supports the Fellowship in General Medicine and Primary Care at Harvard Medical School. ■

## Mechanically Ventilated Patients With Candida Have Increased Mortality

BY MICHELE G. SULLIVAN

NASHVILLE, TENN. — *Candida* infections are associated with a significant increase in hospital length of stay and a twofold increase in mortality in patients who require mechanical ventilation during a stay in the intensive care unit.

"Whether *Candida* species colonization of the respiratory tract secretions is a marker of disease severity or actually contributes to prolonged mechanical ventilation, ICU and hospital stay, and mortality requires further evaluation," Dr. Marc M. Perrault said in a poster presented at the annual congress of the Society of Critical Care Medicine.

"The role of antifungal therapy in these patients also remains to be determined," said Dr. Perrault, a pharmacist at the McGill University Health Center in Montreal.

He and his colleagues retrospectively analyzed data collected during a large clinical trial that randomized 740 critically ill, mechanically ventilated patients to bronchoscopy or endotracheal aspiration, followed by randomization to treatment with meropenem alone or in combination with ciprofloxacin.

Of the 274 patients who had negative bacterial cultures on

enrollment, 64 subsequently tested positive for a *Candida* species. The mean age was 60 years; the mean APACHE II score was 20. At baseline, three characteristics were significantly different between the groups: antibiotic use in the past 3 days, respiratory rate, and white blood cell count. The final analysis controlled for these risk factors.

In the univariate analysis, 14-day mortality was not significantly different between the groups. But at 28 days, patients with *Candida* infections were more than twice as likely to have died—31% vs. 15%, a significant difference. ICU mortality was also significantly higher in the *Candida* group (29% vs. 14%; odds ratio, 2.65). Cumulative in-hospital mortality was more than twice as common in *Candida*-infected patients (43% vs. 20%).

When the researchers controlled for the risk factors, patients with *Candida* infections were still more than twice as likely to die in the hospital as those without the infections.

Intravenous antifungal treatment was given to 15 patients with *Candida* (22%) and 26 without (13%). No treated patient developed candidemia, but the report did not state how many untreated patients developed that complication. ■