
Hospital-Based Strategies for Improving Influenza Vaccination Rates

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Background. Patients at highest risk for complications from influenza have the lowest rates of vaccination. Each year there are thousands of deaths related to influenza. Many of those who are hospitalized or who die from influenza-related conditions were hospitalized during the preceding influenza vaccination season but not vaccinated.

Methods. Six community hospitals in northern Minnesota participated in a pilot project to assess the feasibility and effectiveness of three different community hospital-based influenza vaccination programs during the 1991–1992 immunization season. Records of patients discharged from each institution during November and December 1991 were reviewed for documentation of indications for influenza immunization and to determine whether vaccination was offered and whether vaccination occurred before discharge.

Results. In hospitals choosing to implement standing orders for their nursing staffs to review indications for

influenza vaccination and administer if indicated, 95.2% of patients were offered vaccination. In hospitals depending on physician chart reminders, 22% of patients were offered vaccination. In hospitals relying on physician education strategies to promote influenza vaccine, only 11.7% of patients were offered vaccination. Documented immunization rates in these three groups were 40.3%, 17%, and 9.6%, respectively.

Conclusions. Programs implementing standing orders for nursing staffs were more effective than educational programs or physician reminders in offering and administering influenza vaccine to hospitalized patients. Hospital policies can expand the number of high-risk and elderly persons who receive influenza vaccination each year, but hospitals need to be reimbursed for this service to ensure institutional support.

Key words. Vaccines; influenza, immunization; immunization programs. (*J Fam Pract* 1994; 38:258-261)

Influenza is a major contributor to morbidity and mortality in this country. Despite recommendations that patients with chronic medical conditions and those 65 years or older be vaccinated against influenza,¹ approximately 20% of the elderly and 10% of younger patients with chronic diseases receive the influenza vaccination annually.^{2,3} In a large study of adults in Manitoba,⁴ those with the greatest risk of influenza-related complications

were least likely to be vaccinated. The US Government has set a goal of an immunization rate of at least 60% for high-risk people.⁵ Strategies for both inpatient and outpatient studies have been undertaken to increase influenza vaccination rates for these high-risk individuals.^{6,7}

The highest incidence of mortality from influenza is in persons with underlying chronic medical conditions,^{8,9} which can result in frequent hospitalizations. Several studies have looked at the vaccination status of patients hospitalized during the months when influenza vaccination is recommended. During the influenza season, approximately 40% of elderly patients who were hospitalized with influenza-associated respiratory conditions and 65% of those patients who died from these conditions had been hospitalized during the previous vaccination season for similar conditions but did not

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receive the influenza vaccine.⁴ Many of these hospitalizations and deaths could have been prevented if influenza vaccination had been given during the previous hospitalization.^{9,10} These cases represent missed opportunities for an important subgroup of high-risk patients.

The Minnesota Coalition for Adult Immunization (MCAI) is one of eight pilot-project groups established by the National Coalition for Adult Immunization's Influenza and Pneumonia Action Group. The goal of the pilot projects was to increase the use of influenza and pneumococcal vaccines. Strategies to accomplish this goal were designed to increase the awareness of physicians, other health care professionals, and the general public regarding the need for and benefits of adult immunizations.¹¹ With the assistance of MCAI, three strategies were identified to promote immunization among high-risk patients hospitalized during the influenza vaccination season. This paper evaluates these strategies.

Methods

Six community hospitals in northern Minnesota were invited to participate in a pilot project to assess the feasibility and effectiveness of a community hospital-based influenza vaccination program during the 1991–1992 immunization season. Members from each staff of the participating hospitals were visited and given a manual explaining the importance of targeting hospital-based patients for influenza immunization. The manual also contained pertinent medical literature, such as the "Important Information Statement on Influenza" issued by the Centers for Disease Control and Prevention (CDC). Suggestions were provided on how to develop and implement the vaccination program. The recommended program called for development and implementation of standing orders that required the nursing staff to review each patient for indications for influenza vaccination and, if indicated, administer the vaccine before discharge. Each participating hospital was encouraged to develop and tailor its program according to the institutional structure and needs of the medical community.

In March 1992, each participating hospital was surveyed with a 9-item questionnaire. Hospital demographics were recorded and characteristics of the hospitals' programs and implementation strategies were solicited. Additional information was requested about difficulties encountered with the program. Records of patients discharged from each institution during November and December 1991 were reviewed for documentation of indications for influenza immunization and of whether the patients were offered or given influenza vaccine before discharge. In this region of the United States, influ-

enza vaccinations generally are given from mid-October through December because influenza outbreaks usually occur later in the winter months. Reasons cited for the influenza vaccination being indicated but not given include patient refusal, medical contraindication, and failure to offer the vaccine.

Results

Of the six participating hospitals, two hospitals established written policies regarding influenza vaccine. Standing orders for nursing staffs to identify patients in need of influenza vaccine and to administer them according to CDC guidelines were approved by the hospital staff. Patients who were candidates and had not previously received influenza vaccine that year were offered vaccination. This standing order required no physician action. These hospitals, which comprised the Standing Order Group, had an average of 28 beds and an average of 609 discharges in 1991.

Two institutions created written policies using physician reminders in patient charts as their strategy for enhancing immunization. One institution applied a sticker to the front of the chart reminding the physician to review indications for influenza vaccination and to order the vaccine if appropriate. The other institution used a special order sheet inserted in the chart at the time of admission. Information on the order sheet reviewed the indications for influenza vaccination and asked the physician to check one of two options: physician order or refusal of the vaccination. In the latter case, several additional checks were provided on the order sheet to indicate reasons for not immunizing at that time. These hospitals, which made up the Physician Reminder Group, had an average of 106 beds and an average of 1925 discharges in 1991.

The remaining two hospitals did not implement a written policy. Instead, their strategy consisted of providing materials to physicians about influenza vaccination. This was carried out through hospital pharmacy bulletins and reminders posted at the physician entrances to the institutions. These hospitals, which comprised the Physician Education Group, had an average of 275 beds and an average of 11,800 discharges in 1991.

In institutions where hospital policies were written and standing orders implemented, 95% of patients for whom influenza vaccination was appropriate were offered the vaccine before discharge (Table). In institutions where chart reminders were used, only 22% of patients were offered the vaccine. This dropped to 11.7% in institutions where only physician education strategies were implemented. Analysis using chi-square shows a

Table. The Effectiveness of Three Influenza Immunization Strategies on the Offering and Administration of Vaccinations to High-Risk Patients Before Discharge from the Hospital

Outcome	Strategies		
	Nursing Staff Standing Order, %	Physician Reminder, %	Physician Education, %
Patients offered influenza vaccine	95.2	22.0	11.7
Patients vaccinated before discharge	40.3	17.0	9.6

statistically significant difference between the three groups ($P < .001$).

Not all the patients offered the influenza vaccine elected to be vaccinated. At the time of discharge, 40.3% of the Standing Order Group, 17% of the Physician Reminder Group, and only 9.6% of the Physician Education Group were vaccinated against influenza. Chi-square analysis showed a statistically significant difference between the Standing Order Group and the Physician Reminder Group ($P = .002$), whereas the difference between the Physician Reminder Group and the Physician Education Group was not statistically significant.

A review of the results of the surveys indicates that the influenza vaccination program was well received by each of the hospitals. One barrier reported by all the hospitals was lack of reimbursement.

Discussion

Strategies were identified to improve the rate of offering the influenza vaccine to high-risk patients before hospital discharge. The strategy based on standing orders for nursing staffs to identify appropriate candidates and administer influenza immunization resulted in a significant increase in the vaccination rates. Fewer patients were offered the influenza vaccine when physician input was required. The refusal rate was lower, however, in institutions where physicians were involved in the decision to offer immunizations. It has been reported that 73% of patients who are offered the influenza vaccine have negative attitudes toward the vaccine.¹² For example, patients have felt that the vaccine causes illness, does not provide protection against influenza, or is unnecessary. Physician support and encouragement of influenza vaccination is important for patients actually receiving the vaccine.¹³ The results in this study are consistent with these observations. Settings where standing orders were implemented by the nursing staff without physician input had a higher rate of vaccine refusal by patients.

Other barriers identified by the study dealt with

reimbursement for influenza vaccine and its administration. All institutions in this study were interested in improving the vaccination rate. As hospitals confront greater economic challenges, however, programs resulting in nonreimbursed expenses are more difficult to implement. The vaccine cost approximately \$3 per dose to the institution involved in this project. One institution charged the patient for the actual cost of the vaccine. All institutions absorbed administration costs associated with giving the vaccine. Actual administration costs were not known. At the time of this study, influenza vaccination was not reimbursed by Medicare or other third-party payers. As more health insurers provide coverage for vaccinations, significant barriers to hospital-based immunization programs will be removed.

There is a methodological limitation to this study. Each institution self-selected its immunization strategy. Since strategies were not randomly assigned, an unintended bias may exist in the sample. The strategy chosen was determined by the executive committee of each hospital. If the attitude of physicians on each committee was reflective of the hospital staff's general attitudes, more active initiatives are likely to be chosen in hospitals where influenza vaccination is highly encouraged.

Conclusions

Smaller institutions implemented strategies that were carried out by nursing staffs. The size of the institution may be a confounding variable. In these institutions, fewer persons needed to embrace the strategies to achieve effective implementation. Several committed staff members could fully implement the program. In these smaller institutions, the biggest barrier was for the staff to remember to check with patients about their immunization status and to record this information. In smaller institutions, physicians and nurses have a closer working relationship, and in such an environment, physicians may be more accepting of strategies calling for greater nursing authority with the nursing staff implementing the program. Cost of these programs could be a another confounding variable. Larger institutions would need to commit a greater amount of staff time to design and incorporate a nurse-implemented program. With multiple nursing stations, considerably more administration costs, for which there is no reimbursement, would be incurred.

Programs that implemented standing orders carried out by nursing staffs were more effective than educational programs or physician reminders in offering and administering influenza vaccine to hospitalized patients. The latter two approaches relied on individual physician or

ders for administration of the vaccine and were not as effective in vaccinating high-risk hospitalized patients against influenza. Eliminating the physician from the process, however, resulted in a greater refusal rate by patients. Hospital policies can expand the number of high-risk and elderly persons who receive influenza vaccine each year, but additional strategies are needed to reduce the rate of patient refusal. Involving physicians directly with the standing order process may improve patient acceptance of influenza vaccination. The 1993–1994 influenza season will be the first year in which Medicare reimbursement is available for outpatient vaccination. To ensure institutional support, hospitals should be reimbursed appropriately for this service.

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