National Patient Safety Goals

Promoting Influenza and Pneumococcal Immunization in Older Adults

Case Scenario. “Mrs. Maud Jenkins,” a 67-year-old woman with diabetes and heart failure, lived in Elkins, a small town in rural West Virginia. She was discharged in October 1998 from a 135-bed hospital that did not assess the need for or administer influenza vaccine. Without the influenza vaccine she had one chance in seven of not surviving the year. Because diabetes had weakened her immune system and congestive heart failure had weakened her cardiovascular system, she was at high risk of subsequent infection if she contracted the flu. Her second infection began late in the season, when she became ill with what seemed to be a mild case of the flu. However, that illness further weakened her resistance to infection, and she developed a secondary pneumococcal pneumonia. Unfortunately, she did not receive the flu vaccine during her hospitalization nor was her need for a pneumococcal vaccination assessed. Mrs. Jenkins had been putting off a visit to her primary care physician, where she could have received both immunizations, because she had felt too sick and weak. One night in early March 1999, she suffered cardiopulmonary arrest due to pneumococcal sepsis. Her husband called the rescue squad, but it was too late. Mrs. Jenkins died of a preventable illness.

Although this case scenario is fictional, the events portrayed highlight the serious adverse consequences of not promoting influenza and pneumococcal immunization in older adults.

Article-at-a-Glance

Background: Reducing the risk of influenza and pneumococcal disease in older adults is a long-standing goal of Medicare’s Quality Improvement Organization (QIO) program and parallels the Joint Commission’s National Patient Safety Goal 10.

Addressing the Goal: Since 1999 the West Virginia Medical Institute has worked with a statewide partnership of health organizations on a program to improve influenza and pneumonia vaccination rates in hospitalized Medicare beneficiaries. Methods included education, audit and feedback, toolkits, and training meetings.

Results: During the first three years (1999–2001) of the effort, the rate of assessment for pneumococcal immunization at discharge increased from < 10% to 74.1% statewide and for influenza immunization from near zero to 63.4% statewide. Since 2002 pneumococcal immunization administration has increased from 16.1% to 41.1%, with similar improvement in influenza measures.

Lessons Learned/Next Steps: Hospitals—and, by extension, long term care facilities—can make dramatic improvements in quality performance in a relatively short time when key staff receive feedback about the need to improve and the tools to assist in improving.
assessing for or administering influenza and pneumococcal vaccines to older patients during hospitalization. In 2003, out of approximately 300,000 fee-for-service Medicare beneficiaries in West Virginia, more than 60,000 beneficiaries had diabetes. Studies conducted by the West Virginia Medical Institute (WVMI), the Quality Improvement Organization (QIO) of the state of West Virginia have documented that about 10% of beneficiaries with diabetes die each year if they receive influenza immunization, compared with about 15% of those who do not get vaccinated.1

Background
West Virginia historically has had high morbidity from influenza and pneumonia, high prevalence of comorbid conditions such as diabetes,7 and low use of influenza and pneumonia vaccines, with concurrent high rates of death and disability from these diseases. West Virginia Medicare beneficiaries also have high health services utilization rates for chronic diseases, with deaths from chronic diseases significantly higher than in the rest of the United States.8

Studies have shown the effects of previous influenza vaccination on subsequent readmission and mortality in elderly patients hospitalized with pneumonia.1,4,5 Case control studies in persons 65 years of age or older have demonstrated protection by influenza vaccine resulting in reduced hospitalization rates of 48%–57% for influenza and pneumonia and of 27%–39% for all acute and chronic respiratory conditions. Furthermore, such studies have shown that during epidemic periods influenza vaccination prevented 43%–49% of deaths due to respiratory conditions.5,7 Medicare beneficiaries who do not receive immunizations use more health services,8 are readmitted more often,9 and have an increased mortality risk, at least for influenza vaccine nonrecipients.10

In addition, West Virginia is a poor state, and people with lower incomes have lower rates of immunization. Until 2000, West Virginia had lagged behind the United States in influenza and pneumococcal immunizations for persons 65 years of age or older.11,12 For the past six years, WVMI has helped acute care hospitals decrease morbidity and mortality due to complications of influenza and pneumonia in hospitalized Medicare beneficiaries. We have achieved this by promoting appropriate immunizations in two separate but related consecutive projects aimed at increasing the rate of pneumococcal and influenza immunizations in patients without contraindications who are hospitalized for pneumonia. We focused on patients with pneumonia because we were required by CMS (Centers for Medicare & Medicaid Services) to assist hospitals in improving certain quality measures in these patients, including immunizations. Although the focus was on patients with pneumonia, we believed that changing care practices related to immunization would benefit all hospitalized elderly patients.

During the first project, conducted from August 1999 through July 2002, the quality indicator was the percentage of patients with pneumonia (and without contraindications) who were assessed for or given vaccine against influenza or pneumococcal disease, as determined from chart audits by trained WVMI nurse abstractors. During the second project, conducted from August 2002 through July 2005, the measure counted patients who were already immunized, who received vaccine during the hospital stay, or who had an immunization scheduled after discharge. Assessment alone was insufficient. At the beginning of this project WVMI conducted the chart abstractions, but within the first year hospitals began abstracting their own data. The intent of both projects was to encourage hospitals and their staff to protect all vulnerable patients by administering recommended immunizations.

Reducing the risk of influenza and pneumococcal disease in institutionalized older adults is one of the 2005 National Patient Safety Goals (Goal 10) promulgated by the Joint Commission on Accreditation of Healthcare Organizations.13 This goal, which is applicable to assisted living, disease-specific care, and long term care, entails the requirements to develop and implement a protocol for administration and documentation of the flu vaccine and of the pneumococcus vaccine.8

This article describes examples of interventions implemented in acute care hospitals throughout West Virginia that have led to significant and sustained improvement in the rate of flu and pneumonia vaccinations among the at-risk population. Although the setting—acute care hospitals—is not specified in the Joint Commission National Patient Safety Goal, we believe the ideas

* An additional requirement—Develop and implement a protocol to identify new cases of influenza and to manage an outbreak—is not addressed in this article.
successfully employed are readily transportable to long
term care and disease-specific care facilities in any location.

The setting for the immunization intervention activities
included fee-for-service Medicare beneficiaries hos-

termed in 42 acute care hospitals in
in West Virginia between 1999 and 2003. Informed consent
and Institutional Review Board approval were not
required because federal law provides CMS with access
to the medical records of Medicare beneficiaries, and the
quality improvement project did not meet the statutory
definition of human subjects research.

Mobilizing for Patient Safety

To assist hospitals in increasing rates of influenza and
pneumococcal immunization in Medicare beneficiaries,
WVMI collaborated with several organizations, including
the West Virginia Hospital Association, the West Virginia
Immunization Coalition, and the West Virginia Healthcare
Association. WVMI also collaborated with local content
experts and champions (leaders recognized by peers
for their expertise who adopt and advocate for a goal).
Building coalitions was a necessary step to create the
credibility needed to persuade our hospital partners to
change their policies and procedures relating to inpatient
immunization. Our approach was to educate, audit, and
provide feedback on immunization rates, materials (tool-
kits), and training about health system changes known to
improve immunization performance to all 42 acute care
hospitals in the state. WVMI staff provided training,
including registered nurses (RNs), master's level nurses
(MSNs), and physicians, all with hospital experience.

Addressing the Goal

In 2000 WVMI and its partners collaborated on a pro-
gram to initiate and/or increase immunization services in
hospitals and long-term care facilities located within the
state. Research has shown that systems-oriented
provider interventions are effective in promoting
influenza and pneumococcal vaccinations14 and that
providers are the most important factor influencing vac-
cination decisions among the elderly.15 This program
included five distinct elements: provision of and training
on instructional materials (toolkits), collaborative learn-
ing sessions, audit and feedback reports, staff education,
and individual hospital visits.

Toolkits. The keystone of our intervention program
was the West Virginia Inpatient Immunization Toolkit.
The toolkit, an 80-page binder, was designed to offer
providers an opportunity to examine care processes
within their facility, determine the most practical meth-
ods for improving immunization rates, adopt any
changes, and then measure their success (Table 1, page
289). The community/patient education section included
standard templates that hospitals could modify to meet
their individual needs. Community outreach activities
also included newspaper and television coverage.

Collaborative Learning Sessions. Training on
using the information in the toolkits took place at col-
laborative learning sessions. The sessions also
addressed data collection; the measures and the inclu-
sion/exclusion criteria were provided. Beginning in June
2000, these learning sessions were held across the state
in four geographically dispersed locations, so staff
attending would have no more than a two-hour drive.
The learning sessions lasted approximately six hours,
and nurses attending the meetings earned continuing
education credits. Sixty individuals representing 33 of 42
acute care hospitals in the state attended one or more of
the first regional learning sessions. One hundred long
term care facilities were also invited to attend (40 sent
representatives), although this intervention was not
specifically aimed at them. This training was open to
physicians, nurses, infection control practitioners, and
administrative leadership.

In July 2002, WVMI held additional learning sessions
across the state to provide education to hospital staff on
the new CMS/Joint Commission hospital performance
measures. Staff representing all 42 acute care hospitals
in the state attended. The training emphasized the
change in the influenza and pneumococcal pneumonia
quality measures to reflect immunization rather than
just assessment of immunization status. Hospital self-
reported data were validated by duplicate abstraction of
a sample of hospital-submitted data by CMS's Clinical
Data Abstraction Centers. Hospitals were encouraged to
adopt standing orders (Figure 1, page 290) and/or critical
pathways for administration of influenza and pneumo-
coccal immunizations.

Audit and Feedback Reports. Included in the
collaborative learning sessions were hospital-specific


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reports on Medicare-billed inpatient immunization rates (regardless of whether immunization was received in or out of the hospital). These confidential facility-specific reports were distributed to each hospital QIO contact attending the learning sessions. We have often found these reports to be persuasive evidence for hospitals and physicians to counter the belief that immunization rates are acceptable or that the practices already in place are sufficient for assessing and/or administering immunizations.

**Table 1. Contents of the West Virginia Inpatient Immunization Toolkit**

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<td>Sample influenza immunization orders (physician driven inpatient protocol)</td>
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<td>Sample influenza immunization orders (nurse driven inpatient protocols)</td>
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<td><strong>Sample Forms</strong></td>
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<td>Hospital pneumococcal pneumonia vaccine protocol, consent, physician order, and administrative record</td>
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<td>Influenza and pneumococcal vaccine patient assessment and vaccine administration form</td>
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<td>Sample influenza/pneumococcal vaccine patient assessment and vaccine order/administration form</td>
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**Staff Education.** Staff education was based on a “train the trainer” model. This allowed individuals to attend a regional meeting and then use the information in the toolkit to train additional staff at their facility, thereby providing education at the medical staff department and nursing unit level. WVMI also facilitated communication among hospitals. Those with successful programs were willing to share their interventions, successes, and barriers with others. The project coordinators conducted monthly telephone conference calls with hospitals to share this information.
Individual Hospital Visits. Training did not occur only at learning sessions. WVMI’s health care quality improvement director [R.C.] and RN project coordinators made visits to individual hospitals to provide education to medical staff, nursing staff, and administrative leadership on the immunization project. During the course of the year, the project coordinators worked with hospitals to increase their immunization rates. Interventions were based on hospitals’ assessments of barriers to immunization found during onsite visits by the project coordinators.

RN project coordinators continued to work with hospital staff to address any barriers to implementation of the immunization program beginning in Fall 2002. The project coordinators made quarterly onsite visits to all 42 acute care hospitals to evaluate the immunization programs. The health care quality improvement medical director made follow-up visits to help hospitals encountering barriers to implementation. For example, in one large facility, medical staff were concerned that hospitalized patients might be too sick to be immunized. We provided information to the medical staff to support immunization before discharge. A medium-sized facility was not interested in implementing standing orders but was able to increase its pneumococcal immunization rate to 70% after implementing physician reminder stickers. A small rural hospital addressed the problem of medical record documentation of previous immunizations by stipulating that the infection control nurse was to follow up on each eligible patient regarding his or her immunization status.

Special Program for Critical Access Hospitals

As a part of this work, in February 2002 we began an influenza and pneumococcal pneumonia immunization project solely for the 11 critical access hospitals—small, rural hospitals with fewer than 25 beds that are reimbursed by Medicare on a fee-for-service basis—in the state. These hospitals were overwhelmed by working with larger acute care hospitals, and their representatives felt they did not have the same issues because of size, geographic variation, and other demographic differences.

The critical access project used a modified collaborative model. We adapted the Inpatient Immunization Toolkit and other aspects of the project by scaling down the suggested interventions and activities and increasing the timeline for implementation. Ten of the 11 critical access hospitals in the state agreed to collaborate on this project. The project involved monthly telephone conference calls, as these staff were often unable to attend conferences in person. All the hospitals met the goal of evaluating immunization status by October 2002.

Figure 1. Hospitals were encouraged to adopt standing orders for the administration of influenza and pneumococcal immunizations.

<table>
<thead>
<tr>
<th>Indications for Influenza Vaccine: Give information sheet to patient.</th>
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<tbody>
<tr>
<td>Age ≥ 50 years old</td>
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<td>Age &lt; 50 years old with a chronic illness:</td>
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<td>Alcoholism</td>
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<td>Diabetes</td>
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<td>Cardiovascular disease</td>
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<td>Chronic cirrhosis</td>
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<td>Chronic liver disease</td>
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<tr>
<td>People living in a setting with identified increased risk (Nursing Home, Personal Care Home)</td>
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<tr>
<td>Anyone greater than 6 mos. of age working or living with high risk patients</td>
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<tr>
<td>Healthy pregnant women who will be in their 2nd or 3rd trimester during the flu season</td>
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<tr>
<td>All healthcare workers</td>
</tr>
<tr>
<td>Anyone who wishes to reduce the likelihood of becoming ill with influenza</td>
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</table>

Assess Patient for Contraindications:

- [ ] Influenza Vaccine – Contraindicated
  - [ ] Allergic to thimerosal, mercury, or eggs
  - [ ] Previous severe reaction to influenza vaccine
  - [ ] Terminal condition
  - [ ] Patient refusal
  - [ ] Physician order NOT to vaccinate

- [ ] Influenza Vaccine - Indicated
  - Transcribe vaccine order to the MAR (include vaccine lot #)
  - Immunize patient prior to discharge.

Assessed by: ___________________________ Date/Time: ___________________________

- [ ] Influenza Vaccine Given
  - May give as pt. is afebrile (temp < 100.4 degrees)
  - May give at the same time as Pneumococcal vaccine - in the OPPOSITE ARM

Administered by: ___________________________ Date/Time: ___________________________

MD Signature on file – Approved by: Executive Committee and Medical Director (11/01)
Assessing Current Practice

A useful approach to demonstrate assessment of current practice is to use concrete examples of immunization intervention activities that support the National Patient Safety Goal recommendations. The following example illustrates a “best of the best” program used by an individual hospital.

One large, tertiary care medical center had a baseline rate of 0% for influenza and pneumococcal immunizations at the start of the project in 1999, as determined by chart reviews by WMI nurse abstractors. Immunization status was not documented in the medical record. Medical staff were resistant to adopting standing orders for immunizations. In 2000, WMI quality improvement staff met with the medical center’s nursing standards and practice committee to suggest revision of the adult admission profile to include documentation of influenza and pneumococcal pneumonia immunization status. After a pilot project on the pulmonary unit, the nursing standards and practice committee approved the form and educated the nursing staff on its use in documenting immunization status.

During the fourth quarter of 2000, the proportion of inpatients with pneumonia screened for influenza vaccine immunization status in the facility was 17%, and the rate for all large hospitals within the state (this facility’s peer group) was 30% (versus 17% and 34% for pneumococcal vaccination status). WMI continued on a quarterly basis through the next year to provide feedback data on performance on both measures to all large hospitals in the state. This facility increased its rate of influenza screening to 85% by the fourth quarter of 2001 (versus 63% for all large hospitals in the state). The pneumococcal screening rate in the large medical center increased to 82% in the same quarter (versus 65%).

Identifying and Implementing Solutions

In the second project, which began in August 2002, the CMS quality measures were changed to include assessment and administration (rather than assessment or administration) of influenza and pneumococcal pneumonia immunizations to patients with no contraindications to the vaccines. One of our large medical centers decided to form a multidisciplinary task force composed of infection control, nursing, and medical staff to implement a facilitywide immunization program. The goals of the task force were as follows:

- To develop standing orders for influenza and pneumococcal immunization
- To document administration of immunizations consistently in the medical record
- To educate nursing and medical staff on the need to immunize
- To give feedback on rates of immunization
- To provide patients with permanent records of their immunization status

The medical center worked with WMI on expansion of the project to meet these goals. The hospital’s medical director for internal medicine chaired the task force and acted as champion for the project.

This hospital succeeded in adopting standing orders for one group of patients, those with community-acquired pneumonia (CAP), in spring 2003. Documentation of immunization status is also now included on the nursing adult admission profile. The actual administration of the vaccine is recorded on the medication administration record (MAR). This hospital also adopted the Adult Immunization Record developed by WMI to be given to all patients immunized during hospitalization.*

During the fourth quarter of 2003, 70% of patients admitted with a diagnosis of CAP received an influenza immunization before discharge, and 65% received a pneumococcal vaccination before discharge.

Feasibility and Implementation Issues

Two main issues surrounding feasibility and implementation were evident in these projects. First, many physicians were reluctant to immunize hospitalized patients. This issue was resolved by providing these physicians with journal articles and best practices from the Advisory Committee on Immunization Practices16 and other sources concerning immunization of hospitalized patients, as well as discussions with our medical director. Second, some hospitals were reluctant to immunize patients in the hospital setting rather than on an outpatient basis because Medicare does not reimburse for immunizations under diagnosis-related groups. We

* The Adult Immunization Record is available by e-mail request to Ms. Hannah.
addressed this issue by providing fact sheets and a video to each hospital explaining the process of roster billing for immunizations so that hospitals could recoup their costs.

**Results**

During the first project (1999–2002), measured rates of compliance (as determined by WMVI chart abstraction) with pneumococcal and influenza immunization indicators in hospitalized Medicare patients with pneumonia in West Virginia increased dramatically. Overall rates of assessment or administration for pneumonia vaccine increased from less than 10% in 1999 to 74% in 2002. For influenza vaccine, the rate increased from near zero in 2000 to 63% in 2002. During the second project, between 2002 and the first quarter of 2004 (the latest for which we have data), the hospitals abstracted their own data on a quarterly basis. Immunization rates for both the influenza and pneumococcal quality measures were lower than during the first project because they represent actual immunization rather than assessment. These rates for pneumococcal immunizations also show an encouraging upward trend, but rates for influenza immunization were still fluctuating (Figure 2, above).

**Lessons Learned/Next Steps**

Hospitals—and, by extension, long term care facilities—can make dramatic improvements in quality performance in a relatively short time when key staff receive feedback about the need to improve and the tools to assist in improving. We believe that there are several keys to this improvement. First, there was a collaborative effort involving the QIO, the state hospital association, nursing home association, and immunization coalition. Second, the changes needed to achieve quality performance were modest and were often within the span of control of the individuals charged with making it happen. For example, implementation of a nursing assessment at discharge coupled with standing orders for immunization could reliably satisfy a vaccination performance measure. Third, there was continuous feedback during several years. In the past two years, public reporting of quality measures has contributed an additional measure of accountability.

WVMI plans to continue to work with hospitals and long term care facilities to increase influenza and pneumococcal immunization rates. Providing the staff in these facilities with the tools and background needed to implement a standing orders protocol is a necessary first step but much more remains to be done. Even in those facilities with standing orders for vaccination of older patients without contraindications, compliance is generally less than 100%. Discovering the reasons for noncompliance and developing the tools, processes, and procedures needed to make sure that every appropriate patient is immunized will be a focus of our work in the future.

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References


