

# Improving Pneumococcal Vaccination Rates in an Elderly Population by Patient Education in an Outpatient Clinic

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**Background:** Invasive pneumococcal disease is a major cause of morbidity and mortality in elderly patients. This study investigated the impact of a patient education intervention on the pneumococcal vaccination rate in elders.

**Methods:** Charts of all patients aged 65 years or older who visited a university ambulatory care clinic during a 3-month period were reviewed for pneumococcal vaccination status before the patients' arrival for an office visit. Those who did not have the vaccination were provided patient education in the waiting room. Data were collected on age, sex, race, and immunization status. The reasons for refusing the vaccination before or during this intervention also were obtained. The charts of patients who consented were flagged for the attending physician to order the vaccination if appropriate.

**Results:** Charts of 535 patients were reviewed for pneumococcal vaccination status. Of these patients, 291 had had a pneumococcal vaccination before the study. The cumulative vaccination rate increased significantly from 54 percent to 79 percent after the study intervention. The rate of pneumococcal vaccination was significantly lower among African-Americans than whites both before and after the patient education intervention.

**Conclusion:** This study reports a substantial impact of patient education on improving pneumococcal vaccination rates in an elderly population. Most elders accept vaccination, and it can be delivered effectively without an additional visit. (J Am Board Fam Pract 1996;9:411-13.)

About 40,000 adults die each year from pneumococcal infections,<sup>1</sup> and invasive pneumococcal disease is still a major cause of morbidity and mortality in the elderly population. Mortality associated with pneumococcal disease has been shown to increase with age in patients older than 65 years.<sup>2,3</sup> Higher mortality is also associated with underlying chronic diseases, such as congestive heart failure, diabetes mellitus, malignancy, and alcoholism and cirrhosis.<sup>2,4</sup>

With the emergence of antibiotic-resistant strains of *Streptococcus pneumoniae* and the increasing number of elderly persons, the death rate resulting from invasive pneumococcal disease is expected to increase. A safe, effective, and inexpensive 23-valent polysaccharide pneumococcal vaccine has been available,<sup>5</sup> but the national cu-

mulative pneumococcal vaccination rate has increased only from 14.7 percent in 1989 to 28.2 percent in 1993.<sup>6</sup>

A broad implementation of successful strategies is needed if the national health objective goal of 60 percent vaccination or greater in the elderly population by the year 2000 is to be achieved.<sup>7</sup> This study investigated the feasibility of patient education having an impact on the rate of pneumococcal vaccination in elders.

## Methods

Charts of all patients aged 65 years or older who visited a university ambulatory care clinic from 20 June 1995 to 19 September 1995 were reviewed by a research nurse for pneumococcal vaccination status before their arrival at the clinic. Those who did not have documented pneumococcal vaccination were approached to confirm the status. Those who had not been vaccinated were provided patient education in the waiting room. Presenting the written patient education information<sup>8</sup> and providing a time for questions and answers took approximately 5 minutes. Data were

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**Table 1. Pneumococcal Vaccination by Patient Sex Before and After Patient Education.**

Vaccination Status	Total (n = 535) No. (%)	Men (n = 204) No. (%)	Women (n = 331) No. (%)	z Score Between Men and Women (P Value)
Vaccinated before intervention	291 (54)	114 (56)	177 (53)	0.543 (> 0.05)
Vaccinated before and after intervention	423 (79)	168 (82)	255 (77)	1.467 (> 0.05)
z Score (P value)	-14.03 (< 0.001)	-9.92 (< 0.001)	-10.19 (< 0.001)	

collected on age, sex, race, and immunization status. In addition, the reasons patients chose to refuse vaccination prior to and during this study were also obtained by interview. The charts of the patients who consented to receive the vaccination were flagged for the attending physician to order the immunization if the physician considered the vaccination to be appropriate.

The hypothesis test for proportions was used to calculate differences in vaccination rates by sex and race before and after the intervention.<sup>9</sup> This study was reviewed and approved by university's Institutional Review Board.

## Results

There were 535 patients aged 65 years or older who visited the clinic during the study period whose charts were reviewed for pneumococcal vaccination status. This group of patients represented 33 percent of the 1627 active clinic patients aged 65 years or older. Within the study sample, 204 (38 percent) were male and 331 (62 percent) were female. Of these patients, 291 (54 percent) had had a pneumococcal vaccination before the study intervention, and 132 received pneumococcal vaccination after the patient education intervention in the waiting room. Table 1 shows that cumulative vaccination rate within the study population increased significantly from 54 to 79 percent.

The pneumococcal vaccination rates for both sexes before and after the intervention were similar, and for both men and women there was a statistically significant increase in the vaccination rate after the intervention (Table 1).

Although the rate of pneumococcal vaccination was significantly lower among African-Americans than whites both before and after the intervention (Table 2), there was a significant in-

crease in the rate of vaccination after the intervention for both races. The data for other racial and ethnic groups were too few for meaningful analysis, and approximately 15 percent of the patients did not have race designated in their charts. Consequently, only the 445 white and African-American patients were included in these analyses.

Before their visit, 92 patients had known about the pneumococcal vaccination and had previously chosen not to receive it. The majority who gave reasons why they were not previously vaccinated explained that they were not sick and did not need it or that they had failed to follow up with their physicians. Of these 92 patients, 46 (50 percent) received a vaccination during the study visit, and the remaining 46 refused it. A total of 112 patients refused the offer of vaccination during the study: the 46 who continued to refuse vaccination and 66 patients who refused vaccination after learning about it during the study visit. Most of these patients wanted more time to make their decision and stated that they did not get sick, were afraid of injections, or feared side effects.

## Discussion

This study reports a substantial impact of patient education on improving pneumococcal vaccination rates in an elderly patient population. Most elders accept vaccination, which can be offered

**Table 2. Pneumococcal Vaccination by Race Before and After Patient Education.\***

Vaccination Status	White (n = 373)	African-American (n = 72)	z Score (P value)
Vaccinated before intervention	208	25	3.27 (< 0.001)
Vaccinated before and after intervention	301	47	-2.90 (< 0.001)
z Score (P value)	-12.2 (< 0.001)	4.98 (< 0.001)	

without an additional visit. The effectiveness of the vaccination in elderly patients decreases with age, however, so it is important that patients be vaccinated soon after their 65th birthday, when they are in better health and have a better response to the vaccination.<sup>10,11</sup> Because in our study approximately one third of the total number of elderly patients active in the clinic were seen during the study period, it is reasonable to assume that most elderly patients can be seen in their clinic or informed by mail about the need for pneumococcal vaccination.

The initial vaccination rate in this study before the intervention was higher than the national cumulative pneumococcal vaccination rate of 28.2 percent. As no previous interventions were conducted in this clinic to increase the pneumococcal vaccination rate, it is unclear why the clinic rate was higher than the national average.

The findings of this study are consistent with those of earlier studies reporting no statistical difference in the pneumococcal vaccination rate by sex and a lower rate for African-Americans compared with whites.<sup>6</sup> A similar lower influenza vaccination rate among African-Americans has also been reported.<sup>6,12</sup> The racial differences could be explained by such factors as socioeconomic status, access to health care, and other risk factors.<sup>3,6</sup>

Most of the unvaccinated patients were not aware that vaccination was available. Others knew about the vaccination but made a decision not to receive it, sometimes for uninformed reasons. This finding underscores the need to educate patients about pneumococcal vaccination and remind health care providers to offer it. The acceptance of pneumococcal vaccination by elderly patients and health care providers can also be enhanced by two additional factors: the current recommendation of only a single lifetime dose, and reimbursement by Medicare.<sup>13</sup>

To achieve the national health objective for the year 2000, family physicians should increase patient education about pneumococcal vaccination and patient awareness of its availability. It is possible to improve the pneumococcal vaccination rate through patient education in an outpatient clinic. The patient education brochure used in this study

was obtained from the National Institute on Aging at no cost.<sup>8</sup> Making such materials available to patients in the waiting room augments vaccination efforts. Awareness can be increased further through reminders and the annual influenza vaccination campaign in the media.

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