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Building a Prevention Clinic at the Northport VA to Improve Pneumonia Vaccination Numbers



Namita Akolkar, MD, MPH,¹ Danielle K. Craig, MD, MPH,¹ Lisa Fisher, MD²

Introduction: Pneumonia vaccination rates have increased to >60% over the last 20 years. At the Long Island, New York, Northport VA Hospital, pneumonia vaccination data from 2021 showed a vaccination rate of 68.55%. The goal is a pneumonia vaccination rate of 85%. Pneumonia vaccines prevent invasive pneumococcal disease and pneumococcal pneumonia. The authors aimed to increase vaccination rates at Northport.

Methods: The authors established a weekly vaccine and prevention clinic aiming to vaccinate as many veterans as possible. Preventive medicine residents performed outreach, scheduling, vaccine administration, and Brief Action Planning. Motivational interviewing techniques were used in outreach calls and clinic visits to encourage behavioral change.

Results: From an outreach list >7,000 patients, 506 patients were contacted and counseled on pneumonia vaccination. A total of 130 patients were scheduled for clinic visits. Of these 130, 91 kept their appointments and were seen in the clinic, and 87 vaccines were administered, of which 56 were pneumonia vaccines. Data were collected and analyzed in 2022.

Conclusions: Implementing a dedicated vaccine and prevention clinic using motivational interviewing techniques in outreach and clinical visits allows for optimized patient vaccinations, enhanced information sharing, increased primary care retention, and increasing visibility of preventive medicine among patients and colleagues within the Veterans Affairs medical system.

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INTRODUCTION

Hospitalizations due to community acquired pneumonia have an annual incidence of 847–3,365 per 100,000 adults aged ≥ 65 years.¹ Invasive pneumococcal disease and pneumococcal pneumonia could be prevented with pneumonia vaccination.¹ Pneumonia vaccination has increased over the last 20 years to >60% in high-risk populations (this includes patients with diabetes; those immunocompromised, with chronic heart disease, and with liver or lung disease; and those with tobacco, alcohol, and/or substance use disorders) and patients aged >65 years.¹ At the Long Island, New York, Northport VA Hospital, which is the flagship of the region, the pneumonia vaccination data from 2021 showed a

vaccination rate of 68.55%, a >60% increase but considerably below the national rate of 83.55%. The Veterans Affairs (VA) policy states that the goal is to achieve an 85% vaccination rate. During the coronavirus disease 2019 (COVID-19) pandemic, many Americans fell

From the ¹Renaissance School of Medicine at Stony Brook University, Stony Brook, New York; and ²Northport VA Medical Center, East Northport, New York

Address correspondence to: Namita Akolkar, MD, MPH, Department of Family, Population & Preventive Medicine, Renaissance School of Medicine at Stony Brook University, 101 Nicolls Road, Health Sciences Center, Level 4, Stony Brook NY 11794-8434. E-mail: namita.akolkar@stonybrookmedicine.edu.

2773-0654/\$36.00

<https://doi.org/10.1016/j.focus.2024.100263>

behind on their preventive health interventions, including non-COVID-19 vaccines.^{2,3} This, combined with overworked primary care physicians who had increasingly limited time with their patients and a fragmented system where patients were getting care across many different systems as well as in their local pharmacies,⁴ may have contributed to the decline in documented vaccinations. In June 2021, the Food and Drug Administration approved a new pneumococcal 20-valent vaccine developed by Pfizer,¹ and in early 2022, the VA system released guidelines and a timeline for when the new pneumococcal 20-valent vaccine would be made available to patients. Preventive medicine residents rotating at the VA are tasked with undertaking a quality improvement (QI) project focusing on a specific metric. The authors chose to focus on pneumonia vaccination as their primary metric. Preventive medicine and public health is an American Board of Medical Specialties-recognized specialty that centers its attention on the well-being of individuals and specific populations with the aim of safeguarding, advocating for, and sustaining health and wellness, while also deterring illness, incapacity, and untimely mortality.⁵ Preventive medicine physicians are uniquely suited to improving the rate of all preventive measures through a dedicated preventive services visit. With the primary goal of improving pneumonia vaccination numbers as well as the rate of other preventive services, the authors established a vaccine and prevention clinic that focused their outreach on veterans who were not up to date on their pneumonia vaccinations. Utilizing their clinic and outreach efforts, the authors aimed to increase vaccination of high-risk patients and those aged >65 years in the Northport catchment region within 4 months, which was the duration of the authors' rotation and timeframe allotted for the QI project.

METHODS

Intervention Design

The VA medical system leverages their electronic medical record (EMR) to create reminders for most of the recommended preventive interventions. The authors interrogated EMR members to find out which of their veterans were due/overdue for their pneumonia vaccine because this was the primary metric chosen for the authors' QI project. The authors used this list as a starting point to create a specific resident-run vaccine and prevention clinic. Data were collected from March 2022 to November 2022.

Of the list of patients overdue for their pneumonia vaccination, generated from the EMR, the authors focused their outreach on the patients who had

appointments at the VA clinic on the days the authors provided medical services so that patients would not have to make a special trip to be seen. Authors also focused on patients dependent on their community clinic or Community-Based Outpatient Centers (CBOC) of choice to optimize medical care proximity and minimize obstacles to patient care. Authors started with offering the clinic at 3 locations: 1 at Northport VA and 2 in CBOCs on Long Island, each 30–45 minutes away from Northport. All 3 clinics were in the primary care offices, and the authors coordinated with the reception staff in primary care to help greet their patients. The clinic allowed for dedicated time to counsel patients as well as administer any outstanding vaccines. The patients' primary care physician provided indirect supervision and counseling when needed. The patients did not always see the primary care physician at the time of the preventive care visit, but the primary care physician was made aware of all care and counseling provided. To optimize patients' time at the Northport or CBOC facilities, the authors attempted to schedule as many patients on the same day as other appointments, including podiatry, orthopedics, ophthalmology, other specialists, or primary care. The authors attempted to schedule their appointments prior to primary care appointments. The patients' primary care providers were the indirect supervisors of clinic encounters and cosigners of the medical documentation, thus they reviewed documentation of authors' visit with each patient. The authors also intentionally communicated with providers prior to and after the patient's visit. If there was an urgent concern with a patient, for instance, hypertensive urgency, the authors would contact the primary care physician located in the same area and, if necessary, the emergency room, which was just down the hall from the authors' location at Northport VA. In addition, if a patient had not seen their primary care physician recently or wanted to change to another provider, the authors assisted the patient with obtaining a primary care appointment. This arrangement allowed the authors to begin to create a positive relationship between primary care and preventive medicine housed within the Health Promotion and Disease Prevention department of the Northport VA. The authors also created outreach materials that were shared on the VA's social media pages and sent through patient portal to all the veterans (Figure 1A and B).

Utilizing their clinic and outreach efforts, the authors specifically aimed to increase the pneumonia vaccination rates as their primary QI targets as well as other preventive services and vaccines. The clinic visit was not limited to pneumonia vaccination. Any patient who came to the clinic was given a full prevention visit to include cancer screening, diabetic preventive services, immunizations,

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Figure 1. (A, B) Outreach materials created for VA Northport HPDP department. HPDP, Health Promotion and Disease Prevention; VA, Veterans Affairs.

and substance use counseling. Data collected for QI during this visit included the number of comorbidities the patient had, which were collected as the number of problems on their problem list to serve as a rough numeric

representation of health status. A secondary goal of the clinic was to inform patients about the Health Promotion and Disease Prevention programs for which they were eligible, creating accelerated pathways into groups

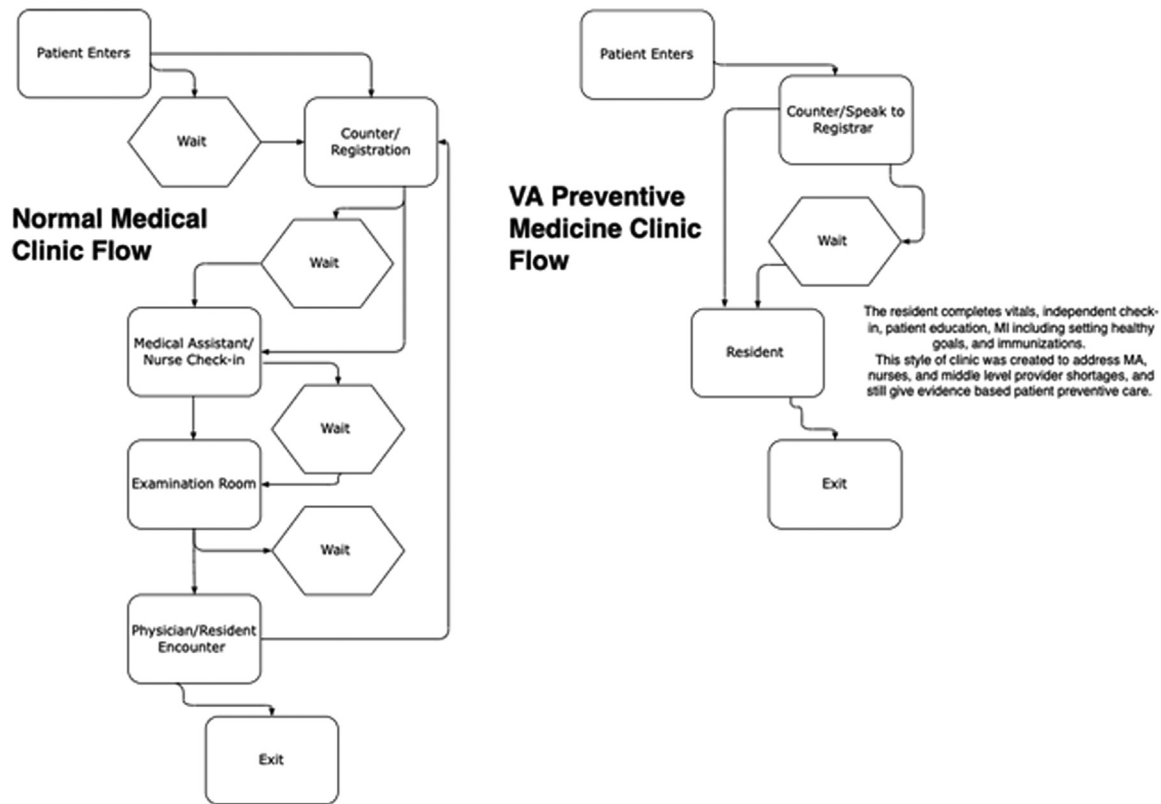


Figure 2. A comparison of the authors' clinic flow with a traditional VA primary care visit clinic flow. VA, Veterans Affairs; MI, motivational interviewing; MA, medical assistant.

with the focus on diabetes, smoking cessation, wellness, and whole health. The authors also aimed to increase primary care retention by encouraging patients to schedule an appointment with a primary care provider after a visit to the authors' clinic. As previously mentioned, the medical staff within the VA system was already significantly overburdened, and thus authors' resident-run clinic decreased wait times, required no additional support staff, and gave patients significant preventive health education. A flow diagram depicting decreased clinic steps, resulting in less wait times, and clinic flow is shown in Figure 2. Authors' clinic visits did not include complex disease management. Most preventive services education occurs in a primary care visit alongside chronic disease management, potentially rushing primary care visits to cover so much in such a short visit. Thus, to have dedicated time to educate and counsel patients on preventive care, the authors aimed to create a pathway for patients to be seen by preventive medicine physicians in a 30-minute dedicated prevention visit. The preventive medicine residents performed outreach, scheduling, clinic triage, vaccine administration, and Brief Action Planning. Motivational interviewing techniques were used in outreach calls and clinic visits to

encourage and educate patients on pneumonia vaccination because this was the primary metric for the authors' QI project. If patients expressed interest in obtaining their pneumonia vaccinations, they were offered a clinic visit.

Evaluation Design

A retrospective cohort analysis was performed comparing the patients seen in clinic with a random selection of the patients who received outreach but did not schedule a clinic appointment. Because this was a QI intervention, a full IRB review was waived. The IRB board was contacted, and details of the intervention were shared with them to explain that patients received the standard level of care, just in a new setting. The IRB deemed that a full application was not required for the QI project.

Data Collection

All patients included in the analysis received an outreach call, during which they agreed to receive a pneumonia vaccine. Data on pneumonia vaccination status, COVID-19 vaccination status, number of comorbidities expressed as problems on the problem list, and a diagnosis of hypertension were collected. Data on 91 patients

were collected at the time of clinic visit, and all services provided in the clinic were recorded. Data on the convenience sample of 88 patients who agreed to receive vaccination at other VA sites but did not come to clinic were collected during the outreach phone call. A review of the charts was conducted in November 2022 to determine whether there was a change in pneumonia vaccination status for all the patients in both groups included in the analysis. Because pneumonia vaccination was the target of the authors' QI project, no other information was accessed from the EMR at that time to maintain patient privacy.

Statistical Analysis

Descriptive statistics, including frequencies and percentages, were used to describe patient population, whereas chi-square tests were used to evaluate differences between groups. Multiple logistic regression models were used to determine which variables were predictive of a greater likelihood of vaccination. All statistical analyses were conducted in SAS, and $p < 0.05$ was considered statistically significant. Analysis was completed in November 2022.

RESULTS

In the initial pilot prior to running the clinic from mid-March through June 2022, an outreach list of >7,000 patients was pulled from the EMR. Of this list, a convenience sample of 506 patients received outreach calls and counseling on vaccinations and preventive care. The convenience sample was chosen on the basis of an appointment at a VA location on the days of the authors' clinic. Of the patients called, 130 were scheduled for a clinic visit; 211 declined a visit but agreed to get the vaccine; 73 had received their vaccines and care outside the VA system and thus were up to date, but this was not reflected in the VA system; and 92 refused vaccinations. A convenience sample of 88 patients was taken from the 211 patients who declined a visit but agreed to get the vaccine at the VA (at a vaccination site other than the authors' clinic) to use as the control group. Tables 1 and 2 show a breakdown of all the services provided during the clinic visits and the demographic breakdown of those seen in clinic as well as the patients who received outreach calls but chose not to be seen in clinic. Ninety-one patients were seen in clinic during a 3-month timeframe, and they were compared with a group of 88 patients who received an outreach call and were willing to get the vaccine within the VA system but opted not to come to clinic. Of those who were seen in the clinic, the pneumonia vaccination rate was 85.7%, compared with 14.7% in the group that did not come to clinic. A chi-square

Table 1. A Summary of Services Provided

Services provided	n
Vaccines	
Pneumovax/Prevnar	56
Tdap	12
Shingles	14
Hep A/B	3
Hep B	1
HPV	1
Cancer screening	
Colon cancer screening	54
Diabetic screening	
Diabetic eye examination	19
Diabetic foot examination	17
Mental health screening	
Suicide screening	14
Depression screening	30
Abuse/neglect screening	19
PTSD screening	12
Substance use screenings	
Alcohol screening	45
Tobacco use screening	63
Total screenings	273
Total vaccines given	86

HPV, human papillomavirus; PTSD, post-traumatic stress disorder; Tdap, tetanus, diphtheria, pertussis.

analysis revealed that there is 5.96 (95% CI=3.58, 9.94) times greater probability of having evidence of a pneumonia vaccine if the patients were seen in the VA vaccine and prevention clinic ($p < 0.001$). Table 3 shows the data of the logistic regression performed to see whether the difference in pneumonia vaccine rates differed

Table 2. Demographics of the Group Seen in Clinic and the Control Group That Was Not Seen in Clinic

Characteristic	Seen in clinic	Not seen in clinic
Race/ethnicity		
White	76	75
Black	9	7
Hispanic	5	6
Asian	1	0
Pneumonia vaccine		
Yes	78	13
No	13	75
COVID-19 vaccine		
Yes	87	67
No	4	21
Average number of problems in the problem list	11.3	11.8
Total	91	88

Table 3. Multiple Logistic Regression Odds of Obtaining Pneumonia Vaccination

Variable	OR	95% CI
Seen in clinic	37.764	15.035, 94.855
Problem list	1.043	0.988, 1.1
Age	1.037	0.997, 1.078
Covid vaccination received	5.869	1.106, 31.136

among various populations. On the basis of several factors, with the primary independent variable being seen in clinic, the other variables evaluated were COVID-19 vaccination, age, and the number of problems on the problem list. Getting the COVID-19 vaccine correlated with increased documentation of pneumonia vaccination (OR=5.869; 95% CI=1.106, 31.136). There was no difference in the rates of pneumonia vaccination on the basis of the number of problems on the problem list or age.

DISCUSSION

Outreach and dedicated clinical visits, utilizing motivational interviewing techniques, allow for optimized patient vaccinations and preventive care as evidenced by greater likelihood of patients getting pneumonia vaccine after being seen in the authors' vaccine and prevention clinic. Multiple studies showed an effectiveness of outreach through various electronic methods, including text messaging, e-mail, and patient portal reminders, in increasing vaccine uptake for various vaccines.^{6–8}

A study in Monroe County, New York compared 2 school-based programs aimed at increasing influenza vaccination rates among U.S. school children. The first program involved low-intensity intervention, which included sending parent reminders and educational messages through e-mail, which were similar to the authors' own outreach calls. The second program was a high-intensity intervention that combined the parent reminder and educational messages with school-located influenza vaccination clinics conducted by health department nurses, which were a small portion of what the authors offered in their clinic visits. The study concluded that parent reminder/education combined with school-located influenza vaccination clinics is effective in raising vaccination rates, whereas parent reminder/education alone is not sufficient to achieve the same result.⁹

A study in Tennessee showed similar results in using students to help with outreach and education on influenza vaccination to marginalized populations and creating pop-up clinics in the community.¹⁰ The results of

these studies are consistent with the authors' findings, which are that the addition of dedicated in-person counseling and care delivery is superior to electronic counseling alone. Just as was seen in the authors' intervention, the clinic visit resulted in greater uptake of vaccination even though the outreach through e-mail and social media as well as the education of the primary care team did also result in an overall increase in vaccination numbers across the system.

COVID-19 vaccination correlated with pneumonia vaccination, suggesting that vaccine hesitancy that emerged from the COVID-19 pandemic was further reaching. The willingness to obtain pneumonia vaccination and COVID-19 vaccination seems to predict those who will be open to getting vaccines in general. Veterans had multifactorial reasons for vaccine hesitancy. Forty percent of veterans studied stated that they would not obtain a COVID-19 vaccination.¹¹ Contrary to other literature, Lan et al.¹² noted an increase in both pneumonia and influenza vaccinations during the COVID-19 pandemic.

Being seen by a preventive medicine resident in clinic was associated with a significantly greater rate of vaccination. The clinic allowed for enhanced information sharing, increased primary care retention, and increasing visibility of preventive medicine among patients and colleagues within the VA medical system. Murchie and colleagues¹³ used nurses to create similar counseling interventions to assist with secondary prevention of coronary artery disease. The clinic staff focused on promoting medical and lifestyle aspects of secondary prevention and offered regular follow-up to the patients. The results showed significant improvements in 6 of 8 health status domains among patients attending the nurse-led clinics, particularly in functional status, pain, and general health. Patients reported fewer worsening chest pain episodes, and there were no significant effects on anxiety or depression. Moreover, the intervention group experienced fewer hospital admissions, but there were no significant changes in general practitioner consultation rates. They concluded that secondary prevention clinics had a positive impact on the health of patients with coronary heart disease within the first year of implementation. The clinics improved patients' health while also reducing hospital admissions during this period.¹³

A review of studies to improve pneumonia vaccination in veterans noted 3 primary themes from the literature: (1) decreased 1-year morbidity and mortality in veterans with comorbid conditions who received pneumococcal vaccination, (2) significant barriers in outpatient vaccination processes, and (3) the spectrum of pneumococcal disease in veterans.¹⁵ This study highlights the added value of an intervention similar to the

authors' clinic, which showed an increase in vaccination rates as well as decreased barriers in the outpatient vaccination process. The service provided by the authors' clinic will assist systems in ensuring that they are continually and consistently staying on top of preventive interventions without taking away the much-needed time in primary care appointments to handle chronic conditions.

Limitations

Problem list length was used as a measure of health status, although a long problem list does not automatically indicate bad health, and a short one does not automatically indicate good health, as a proxy measure for health status. The sample was not diverse because most of the patients were White and male because this is the demographic that the Northport VA predominantly serves. There was an increase in overall vaccinations throughout Northport owing to all the authors' QI interventions. These included education of the primary care providers as well as patient education through e-mail and social media. Finally, the authors must also acknowledge their selection bias. Patients who were willing to come to clinic are also more likely to get vaccinated in general; the authors also should acknowledge the fact that although the 88 patients in their control group stated that they would get vaccinated within the VA system, they could have still chosen to get vaccinated outside the system, and thus their vaccination status in the VA system could be inaccurate.

CONCLUSIONS

The authors believe that a dedicated preventive medicine physician—run medical clinic is a far more suitable environment for preventive medicine trainees than participating in regular primary care visits. At all levels of the U.S. healthcare system and in fostering a prevailing culture of prevention, preventive medicine physicians play a vital and indispensable role.¹⁴ This study supports these assertions, showing the impact of preventive medicine residents in creating a clinic and fostering a culture of prevention.

ACKNOWLEDGMENTS

Funding: None.

Declaration of interest: None.

CREDIT AUTHOR STATEMENT

Namita Akolkar: Conceptualization, Methodology, Data curation, Writing - original draft, Visualization, Investigation. Danielle Craig: Writing - reviewing & editing, Validation,

Investigation. Lisa Fisher: Supervision, Writing - reviewing & editing.

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