

Evaluation of Patient Adherence to Vaccine and Screening Recommendations during Community Pharmacist-led Medicare Annual Wellness Visits in a Family Medicine Clinic

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Abstract

Background: The Centers for Medicare and Medicaid Services initiated annual wellness visits (AWV) to reduce healthcare costs and improve preventive healthcare for beneficiaries. Provider time constraints and varying preferences to perform AWVs have limited its clinical implementation in some areas, affording pharmacists an opportunity to expand their role.

Objective: To evaluate patient adherence to pharmacist recommendations for vaccinations and preventive screenings in an annual wellness visit service at a family medicine clinic in northeast Mississippi.

Methods: This study included patients receiving at least one vaccination or screening recommendation during an AWV. Investigators provided vaccination (influenza, pneumococcal and herpes zoster) and screening (mammograms, DEXA, and colorectal cancer) recommendations based on current guidelines. For services not provided in-clinic, investigators contacted outside facilities 45 days post-visit to confirm adherence to recommendations. Primary endpoints included the composite adherence rate of all recommendations and percentage of patients achieving the 60% goal composite adherence rate. Secondary endpoints included individual vaccination and screening adherence rates.

Results: Investigators recommended 715 interventions to a total of 254 patients, of which 239 were completed within 45 days for a 33.4 percent composite adherence rate. 20.1 percent of all participants achieved the goal composite adherence rate (60%). Overall, participants were 30.5 and 41 percent adherent to all vaccinations and preventive screening recommendations, respectively.

Conclusion: Pharmacists providing AWVs increased patient access to preventive health recommendations. Although, adherence to recommendations remains a challenge and warrants further study. The findings and limitations observed in this study have identified opportunities for future research to evaluate pharmacist-led AWV services.

Keywords: Centers of Medicare and Medicaid Services, immunizations, preventive health screenings, Annual Wellness Visits, pharmacist-led

BACKGROUND

To combat increasing healthcare costs, the Centers for Medicare and Medicaid Services (CMS) initiated annual wellness visits (AWV) to improve preventive healthcare access for its beneficiaries through the Affordable Care Act beginning in 2011.¹ CMS reimburses physicians, nurse practitioners, and physician assistants for performing an initial AWV 12 months after an initial preventive physical examination office visit. Subsequent AWV can be billed every 12 months after the initial AWV is complete.² Required components of an AWV include a complete medication review, functionality assessments, vaccination and screening recommendations, and advance care

planning.³ As the Medicare-eligible population increases, the supply of healthcare providers qualified to provide AWV may be inadequate to meet the demand to provide AWV appropriately for qualified patients.⁴ To help address this deficiency, several previous studies have demonstrated the value of clinic-based pharmacists in conducting this AWV service.^{2,5-7}

Increasing patient adherence to immunizations has been shown to improve preventive health and reduce healthcare costs.⁸ According to Centers for Disease Control and Prevention (CDC) statistics, 61.1 percent of Medicare-eligible patients in Mississippi received an influenza vaccination during the 2017-2018 season.⁹ Pneumococcal immunization rates for Medicare-eligible patients in Mississippi have increased from 67.2 percent in 2014 to 71.8 percent in 2017, while 29.3 percent received the live herpes zoster vaccination (ZVL) in 2017 up from 20.4% in 2014.¹⁰ These low ZVL immunization rates have been attributed to variable insurance coverage and high out-of-pocket costs.¹¹

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Improving patient adherence to preventive screenings can enhance preventive health and reduce healthcare costs. Cancer (i.e., breast, colon) is one of the leading causes of death in the United States.¹² Non-adherence to mammogram screening recommendations could be attributed to low socioeconomic status, low educational attainment, or comorbidities.¹³ Issa and Nouredine et al. report that only 60 percent of patients are adherent to colonoscopy screening recommendations which may be attributed to fear about the procedure, cost, and lack of understanding about its importance or benefits.¹⁴ Similarly, osteoporosis contributes significantly to worsened morbidity and mortality among elderly. Preventive screening is low with only 23 percent of women over 66 years old with a history of fractures having received a dual energy X-ray absorptiometry (DEXA) screening within a six-month period after a fracture.¹⁵

Researchers project improving chronic disease prevention and treatment by the year 2023 could result in potential savings of \$218 billion dollars per year in treatment costs and \$905 billion dollars per year in lost productivity.^{16,17} Despite these projected savings from preventive health services, like AWWs, previous research indicates that Medicare patients are largely unaware of their covered AWW benefit and overall have low participation rates.^{16,18} Beliard et al. reported several potential barriers to increasing the number of AWW performed in the clinic, including provider time limitations, reimbursement limitations of 25 minutes for a subsequent AWW, increased workload impacts on ability to see more urgent patient cases, and lack of perceived value by patients.²

Pharmacists may offer a solution to address many of these barriers to full implementation of AWW. Using pharmacists in an ambulatory clinic to provide AWW has proven to alleviate provider time limitations, reimbursement issues, and may improve patient perception of AWW value.^{2,6,7,19,20} Current doctor of pharmacy (Pharm.D.) curricular standards require extensive training in population health and wellness (i.e., immunizations and preventive screening), making pharmacists a capable and competent healthcare team member for these services.²¹ The Accreditation Council on Pharmacy Education (ACPE) Standards 2016 edition emphasizes the importance of pharmacy school curriculums across the United States advancing population health through several standards (i.e., Standard 1.1, 2.4).²¹ These unique skills and research findings allow pharmacists an opportunity to market their services to clinics, as a solution to increase Medicare patient participation in the AWW service. Previous research has shown pharmacists to be particularly adept at identifying medication-related problems, along with positively impacting adherence to recommendations for pneumococcal vaccinations, DEXA scans, mammograms, and fecal occult blood tests (FOBT).^{2,19,20} It is not well established if a partnership between a community pharmacy and a family medicine clinic can provide similar benefits in implementation of this service.

OBJECTIVES

The purpose of this pilot study was to evaluate patient adherence to pharmacist recommendations for vaccinations and preventive screenings in an AWW partnership between a community pharmacy and a family medicine clinic in rural Mississippi.

METHODS

A collaborative practice agreement and business relationship between an independent community pharmacy and a privately-owned, family medicine clinic in north Mississippi, was established for pharmacists to perform this Medicare AWW service two days per week, beginning in February 2019. The AWW service is performed solely by the pharmacists and is billed by the clinic, with a portion of revenue shared between the pharmacy and clinic. This pilot study was conducted from August 14, 2019 through January 29, 2020. Data analysis was completed via retrospective chart review. The study was approved by the University of Mississippi Institutional Review Board (Protocol #20-009). This study included Medicare patients eligible to participate in an AWW during the study period who received at least one vaccination or screening recommendation during the AWW encounter. Patients eligible for AWW who were up-to-date on all vaccination and screening recommendations were excluded from this study.

Pharmacists screened all clinic patients for eligibility using the “Automated Wellness Outreach” application, provided by AthenaHealth© (Watertown, MA). Once eligible patients were identified, clinic support staff contacted these patients and scheduled their appointments in one of the two clinic workflow models, pharmacist-only or physician co-visit, depending on individual patient needs during their visit. Patients visiting the clinic for chronic disease management follow-up, medication refills, or lab work were placed in the physician co-visit model. Patients visiting the clinic only to complete their AWW were seen in the pharmacist-only model. In both clinic workflow models, pharmacists conducted the AWW service, providing vaccination and screening recommendations according to current Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) and the U.S. Preventive Services Task Force (USPSTF) guidelines. Influenza and pneumococcal (PCV-13, PPSV-23) vaccinations were administered to patients at the clinic, while patients eligible for herpes zoster (RZV) vaccinations were provided a list of local pharmacies offering RZV and asked to identify a preferred pharmacy. Other vaccine recommendations were also discussed with patients as indicated, but they were not included in the study data. Due to available resources at the clinic, all preventive screenings (i.e., mammograms, DEXA, colorectal) were referred and scheduled at outside facilities based on patient preferences at the earliest available date. For patients at average risk for colorectal cancer but who were hesitant or refused to receive a colonoscopy or FOBT, screening with a stool DNA test (e.g., Cologuard) was offered. All vaccination and screening recommendations, in-clinic

vaccination administrations, and scheduled screening appointments were documented in the electronic health record. Investigators contacted the patient's preferred pharmacy or screening facilities via telephone 45 days after the AWV to determine if the recommended vaccinations or screenings were completed. This time period was chosen because all referrals were available to be scheduled within 45 days at the nearby facilities.

Primary endpoints for the study included the composite adherence rate for all vaccination and screening recommendations among the study population and the percentage of patients who achieved the a priori goal composite adherence rate of 60%, based on literature review and consistent with findings from similar research in the field.²² Secondary endpoints included individual adherence rates for each vaccination and preventive screening, along with composite patient adherence rates for each AWV workflow model. Investigators defined adherence as the percentage of vaccine and screening recommendations that the patient had completed within the post-AWV follow-up period of 45 days. Investigators used Microsoft Excel® (Redmond, WA) to conduct all statistical analysis, which included descriptive statistics and chi-squared test for comparing adherence rates for each clinic workflow model.

RESULTS

A composite total of 715 vaccination and screening interventions were recommended to the 254 patients from both clinic workflows, resulting in an average of 2.8 recommendations per patient. Table 1 outlines patient demographics and AWV characteristics observed during the study. The mean age was 71.8 years, with 63.4 percent of participants being female. A total of 74.8 percent of patients participated in an AWV within the physician co-visit workflow, and 57.1 percent of all AWV encounters were classified as a subsequent AWV.

A composite total of 239 vaccine and screening recommendations were successfully completed by patients in both clinic workflows within the 45-day follow-up period, resulting in a composite adherence rate of 33.4 percent within the study population. Of the total 254 patients included in this study, 51 patients (20.1%) achieved the a priori composite adherence rate goal of 60 percent in the follow-up period. Additional vaccine and screening-specific recommendation details and other secondary endpoint results are described in Table 2.

Overall, a composite total of 515 vaccinations were recommended to patients in both clinic workflows during this study, with 157 vaccinations being administered to patients at the clinic or the patient's pre-defined, preferred pharmacy within the follow-up period, resulting in a total vaccination adherence rate of 30.5 percent. Patients in this study were 56.4 percent adherent to influenza vaccination recommendations,

as well as 43.8% and 60.6% adherent to PCV-13 and PPSV-23 recommendations, respectively. The RZV vaccination was the most recommended vaccination (n = 227) and showed the least patient adherence (1.3%). One potential confounder impacting vaccination adherence was same day clinic vaccine availability, as a total of 34 in-clinic vaccinations (33 patients, one patient with two recommended vaccinations) were recommended when the vaccine was unavailable. Of these 33 patients who agreed to receive the vaccination during the AWV, only 13 patients returned to the clinic to receive the recommended vaccinations.

A total of 200 preventive screenings were recommended to patients in both clinic workflows during this study, with 82 screenings completed within the follow-up period, resulting in a total screening adherence rate of 41 percent. Results indicated that when pharmacists prospectively scheduled these screenings after the AWV (n = 115), patients were 62.6 percent adherent to the scheduled appointments within the follow-up period, compared to 7.7 percent adherence when patients elected to schedule their own screenings after the AWV (n = 13). Patients were 47.4, 36, and 38.8 percent adherent to mammogram, DEXA, and colorectal screening recommendations, respectively.

Comparing the two clinic workflow models, 64 patients participated in the pharmacist-only model and 190 patients in the physician co-visit model. In the pharmacist-only model, 58 of the 167 total recommended interventions were completed by these patients within the follow-up period, resulting in a composite adherence rate of 34.7 percent. In the physician co-visit model, 181 of the 548 total recommended interventions were completed by these patients within the follow-up period, resulting in a composite adherence rate of 33 percent, indicating no difference between patient acceptance of pharmacist recommendations between the two workflow models (p = 0.683).

DISCUSSION

Overall, 33.4 percent of recommended immunizations and screenings were completed by patients in the study population within the 45-day follow-up period. The mean of 2.8 recommended immunization and screening interventions per patient confirms findings from Galvin et al. that pharmacists can close gaps in preventive screening and immunization needs for patients.²² Notably, only one in every five patients included in the study population met the a priori composite adherence rate of 60% for immunization and screening recommendations provided during the AWV service. Patient adherence to all recommendations was still below state averages and could be at least partially attributed to lack of resources in the rural study area, causing patients to need to travel long distances to complete screenings. Other specific reasons for nonadherence are addressed below.

Comparing the study population with CDC immunization data for all Mississippi adults ≥ 65 years old, adherence rates for all individual vaccine types and preventive screenings observed in the study were below state average.^{9,10} Figure 1 demonstrates the comparison of vaccination adherence rates for AWW patients in this study to the 2017 immunization rates for adults ≥ 65 years old in Mississippi. RZV was the most recommended vaccination ($n = 227$), but it demonstrated the lowest adherence rate of 1.3 percent among patients in the study. Based on previous research findings, issues with the RZV vaccination, such as Medicare Part D billing and patient cost, are not unique to this clinic setting.¹¹ As part of the Inflation Reduction Act, beginning January 1, 2023, Medicare Part D plans will be required to cover all ACIP-recommended vaccines, including RZV, with no deductible and no cost-sharing. This should also remove the significant cost barrier to receiving vaccinations for Medicare beneficiaries.²³ Similarly in this study, RZV was not provided in the clinic, and therefore, patients were referred to their local pharmacies for vaccination administration. Of note, multiple patients in this study used mail-order or local pharmacies that did not offer immunization services. Of those patients who utilized pharmacies that did not offer immunization services, 100 percent did not receive the RZV vaccination within the study follow-up period. This finding highlights the potential for future research into patient trust and the collaborative opportunity for community pharmacists providing this AWW service in a family medicine clinic. Community pharmacies in collaboration with clinics could easily leverage their ability to bill for Medicare Part D for the RZV vaccine and may significantly impact adherence rates for this vaccination. Further emphasizing this availability and timing phenomenon is our findings regarding the 33 patients who were unable to receive a same day clinic-provided vaccine due to insufficient inventory. Only 13 of the recommended 34 vaccinations in these patients were successfully completed within the study follow-up period. This occurrence demonstrates the convenience of same-day vaccination and the importance of maintaining a sufficient vaccine inventory when providing this AWW service.

Investigators observed that patients in this study were more adherent to recommended screenings (41 percent) than vaccinations (30.5 percent). Study results indicated that patients who left the clinic with their screenings already scheduled were more adherent to the appointments within the follow-up period than those patients who chose to schedule their own screenings. Further research confirming this finding could help with future implementations of this pharmacist-led AWW service model and could further bolster the critical role of clinic support staff in the scheduling process.

Comparing adherence rates between the pharmacist-only and physician co-visit model found no statistically significant difference ($p = 0.683$) in the primary outcome, although a larger percentage of patients participated in an AWW within the physician co-visit model. Further application of this finding is

limited, as this study was not designed or powered to account for equal sample sizes in each workflow to detect a true difference. Previous literature has indicated that the physician co-visit AWW model may be more financially viable, when compared to the physician-only or separate-visit models by allowing providers to bill higher-complexity visit codes and increase their daily patient workload, thus generating additional clinic revenue.²⁴ However, investigators believe that future research would be beneficial to help determine if there are any significant differences between the pharmacist-only or physician co-visit model for this AWW service.

Investigators identified several key limitations that may have affected the study findings. First, investigators only conducted follow-up to the patient-selected preferred pharmacy or screening facility documented in the patient's medical records. There is a possibility that patients received a recommended vaccination or screening at another facility, not previously identified during the AWW, and therefore not captured during data collection. Investigators also did not follow-up with the patients or provide them with any reminders within the study period. This should be a critical step in any screening service implementation moving forward. Next, the follow-up period of 45 days after the AWW for this pilot study may be inadequate to observe a true adherence rate for recommendations. This follow-up period was selected to ensure an adequate sample size and provide quality improvement data in a timely manner for this new pilot service within the clinic. Patient adherence for vaccinations and screenings in other studies with longer review times was significantly higher, when compared to current study results.²² Third, current research was only conducted at one family medicine clinic in northeast Mississippi. Additional research focused on evaluating patient adherence in multiple clinics would be necessary to increase external validity of the study findings. Lastly, investigators acknowledged that the lack of a control group using another healthcare professional discipline (i.e., physicians, nurse practitioners) to perform AWW may also be another limitation to the study design, as the presence of a control group, compared with a pharmacist-led AWW study arm, may have been a more suitable study design to detect a difference in terms of adherence to vaccine and screening recommendations.

The authors hope that the outcomes of this study will catalyze future research efforts and quality improvement measures for performing a pharmacist-led AWW service in family medicine clinics. Since this pilot study was initiated, investigators now have remote VPN access to use the collaborating community pharmacy's pharmacy management system (PMS) to bill the Medicare Part D benefit directly and provide same-day RZV immunizations in the clinic. Newer billing services targeted at pharmacies and providers may be useful if remote access to the PMS is not available. Additionally, investigators have assumed responsibility for monitoring vaccine inventory of clinic-provided vaccines. Finally, the COVID-19 pandemic caused an increase in access to the state immunization registry, which has

improved pharmacists' ability to assess for needed vaccines and update documentation. Ultimately, research into this AWV service must be broadened to not only focus on optimal provision of the AWV service, but also how pharmacists can identify and address patient barriers to receiving preventive services.

CONCLUSION

This study demonstrated the successful implementation of a pharmacist-led AWV service at a family medicine clinic. The findings and limitations observed in this study have identified opportunities for future research to further evaluate ways to improve both the provision and efficacy of the pharmacist-led AWV service in a family medicine clinic. Overall, participant adherence to recommended immunizations and screenings at 45 days post-AWV was lower than the composite adherence goal of 60%, but the collaboration between pharmacists and physicians increased patient access to preventive health measures at the clinic. Although a multitude of studies can be conducted, investigators believe further research surrounding patient-specific barriers to vaccine and preventive screening adherence could be conducted to assist with future targeted interventions, aimed at improving the overall preventive health of Medicare beneficiaries across the United States.

The opinions expressed in this paper are those of the author(s).

Conflicts of Interest: We declare no conflicts of interest or financial interests that the authors or members of their immediate families have in any product or service discussed in the manuscript, including grants (pending or received), employment, gifts, stock holdings or options, honoraria, consultancies, expert testimony, patents, and royalties.

Treatment of Human Subjects: IRB review/approval required and obtained.

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Table 1: Baseline Characteristics

Patient Characteristics	
Total patients (n)	254
Age (years)	71.8
Female n(%)	161 (63.4)
Medications (n)	8.6
Disease States (n)	2.2
Disease State Prevalence	
Hypertension n(%)	211 (83.1)
Dyslipidemia n(%)	151 (59.4)
Depression/Anxiety n(%)	87 (34.3)
Diabetes Mellitus n(%)	82 (32.3)
COPD n(%)	21 (8.3)
Heart Failure n(%)	10 (3.9)
Asthma n(%)	6 (2.4)
Osteoporosis n(%)	3 (1.2)
AWV Characteristics	
Initial AWV n(%)	109 (42.9)
Physician Co-Visit Workflow n(%)	190 (74.8)

Abbreviations

COPD: Chronic Obstructive Pulmonary Disease

AWV: Annual Wellness Visit

Table 2: Patient Adherence to Interventions

Total Interventions (n)	715		
Interventions Completed (n)	239		
Composite Adherence Rate (%)	33.4		
Patients achieving 60% Adherence n(%)	51 (20.1)		
Patients achieve 100% Adherence n(%)	11 (4.3)		
	Recommended Interventions	Completed Interventions	% Completed
<i>Vaccines</i>			
Influenza	133	75	56.4
PCV-13	89	39	43.8
PPSV-23	66	40	60.6
Herpes Zoster	227	3	1.3
Total	515	157	30.5
<i>Screenings</i>			
Mammogram	76	36	47.4
DEXA	75	27	36.0
Colorectal	49	19	38.8
Colonoscopy	14	9	64.3
FOBT	20	10	50.0
Declined	15	0	0.0
Total	200	82	41.0

Abbreviations

PCV-13: Pneumococcal Conjugate Vaccine

PPSV-23: Pneumococcal Polysaccharide Vaccine

DEXA: dual energy X-ray absorptiometry

FOBT: Fecal occult blood test

Figure 1: AWV Adherence Rate Comparison

