Building Awareness of the Medicare Annual Wellness Visit in Rural Healthcare

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Abstract

Background/Objective: As a part of the Affordable Care Act of 2010, the Medicare Annual Wellness Visit (AWV) was intended to reduce health disparities and improve health outcomes through providing wellness visits for all Medicare recipients at no cost. However, adoption has been minimal since its inception, particularly in rural populations

Study Design: A top priority of a rural federally qualified healthcare organization (FQHC) was to improve utilization of the AWV due to a patient response well below the national average. A six-week trial was conducted that examined a patient information campaign combined with a strategic workflow that encouraged interoffice collaboration.

Methods: The office staff of a pilot medical clinic was selected by the FQHC quality improvement committee as the project site. A Relational Coordination survey (RC) was administered before and after the intervention to determine if the intervention improved interoffice collaboration regarding the AWV. Descriptive questions were used to determine which aspects of the intervention proved useful. Reliability of the survey results was verified by a Crohnbach's $\alpha > 0.08$. An independent samples *t* test was used with p value < 0.05 to determine statistical significance and confidence intervals.

Results: The patient information brochure demonstrated improved patient understanding of the AWV from the office staff perspective as demonstrated by an independent samples *t* test comparing pre and post survey responses ($t(32) = -4.14$, $p < .001$, CI 95%). The RC survey results identified an area for collaborative for improvement between the front office and medical staff.

Keywords: rural healthcare, Medicare Annual Wellness, utilization, awareness

Background and Significance

The Medicare AWV is a comprehensive tool that allows the healthcare provider to assess physical and psychological health as well as health behaviors for the purpose of creating an evidence-based wellness plan (Centers for Medicare and Medicaid Services - CMS, 2020a). The prevention and screening parameters that make up the AWV were determined by nationally recognized health initiatives including the United States Preventive Services Task Force (USPSTF) prevention guidelines and the Institute for Healthcare Improvement (IHI) Triple Aim Initiative (CMS, 2020). Since its inception in 2011, research has demonstrated that it improves vaccine utilization, referrals to physical therapy, audiologists, and nutrition specialists (Galvin et al., 2017; Warshany et al., 2014). Use of this tool demonstrated statistically significant improvement in multiple preventive services including screenings for cancer, depression, diabetes mellitus, osteoporosis, and cardiovascular disease (Camacho et al., 2017). More importantly, the patients who received the visit were more likely to undergo the recommended services such as behavioral counseling, colonoscopies, bone scans, and mammography (Jiang et al., 2018). By 2015, the AWV was associated with a 5.7% reduction in total healthcare costs including hospitalization and outpatient care (Beckman et al., 2019).

The AWV is an opportunity for the provider and patient to sit down and discuss matters they would not otherwise have the time to discuss during a problem visit. Sensitive subjects such as advance directives, elder abuse screening, assessment for dementia, fall risk, and functional decline are included (Hain, 2014). By assessing these health risks, modifiable risk factors can be uncovered. For example, Jiang et al. (2018) found that reversible cognitive impairment brought on by low levels of thyroid, vitamin B12, and anemia were identified more frequently in the AWV beneficiaries compared with those who did not receive the visit (Jiang et al., 2018).

Rural populations stand to benefit the most from the implementation of prevention and wellness programs because they are more negatively impacted by health disparities namely: poverty, chronic disease, and limited access to primary care services (NRHA, 2021; Rural Health

Information Hub, n.d.). Healthy People 2020 has identified "Health and Healthcare" as one of the five pillars in addressing the Social Determinants of Health(SDoH). They specify access to healthcare, access to primary care, and health literacy as the particular areas that need to be addressed (Office of Disease Prevention and Health Promotion, 2020). Further, the CDC outlined ten essential services to address SDoH. Among them were "inform educate and empower people about health issues" and "link people to needed health services and ensure the provision of healthcare when otherwise unavailable" (Centers for Disease Control and Prevention | CDC, p. 1, 2020).

The AWV addresses these directives and potentially equalizes the distribution of healthcare because it provides the same service to anyone regardless of income, social status, or ethnicity. FQHC organizations are required to provide service to Medicare, Medicaid, and the uninsured providing an ideal gateway for access to healthcare for underserved individuals. When these organizations utilize the AWV, health needs are identified, education about those needs are discussed, and patients are provided with resources to address those needs (Bluestein et al., 2017). Examples of services to which they might be referred are behavioral services, food assistance, physical therapy, diabetic education, and medical specialists, all services covered by Medicare (Center for Medicare and Medicaid Services CMS, n.d.b).

Rural FQHC Provider

Rural healthcare practices that provide care to underserved communities have unique impediments when it comes to adopting the Medicare AWV. Ganguli et al. (2018) demonstrated their patient populations have more comorbid conditions, are less health literate, and lack access to transportation and resources that would facilitate access to care. These practices generally have fewer resources and providers to address the added disease burden of their patients (Ganguli et al., 2018). Additionally, if the AWV is not prioritized and integrated into the daily workflow, the requirements to complete it are time-consuming and cumbersome.

Simpson and Kovich (2019) observed that providers' lack of understanding of the requirements and lengthy documentation were major obstacles to adoption of the AWV.

Though the difficulties for rural providers may seem prohibitive, the potential benefits of enthusiastic adoption of the AWV are substantial. Medicare's reimbursement of the AWV at around $200.00 per visit is more than twice the amount it reimburses for an equivalent 30–40-minute acute care visit at $90.00 (CMS, 2019; Ganguli et al., 2018). Medicare Advantage plans provide even greater compensation which ranges from $150.00 to $650.00 additional incentives per visit (a FQHC organization internal personal communication, 2/12/21). Ganguli et al. (2018) showed that early adopters of the program have enjoyed greater profits, better patient stability, and an overall healthier patient population. In addition, those practices with the higher percentages of Medicare patients per provider were able to replace problem visits with wellness visits leading to higher rates of adoption and better profitability (Ganguli et al., 2018).

Interventions That Increase Utilization

The complexity and confusion surrounding the AWV has proven to be a major obstacle in its implementation. However, many strategies and workflows have been implemented to address the issue. Improved utilization was achieved by using team-based approaches where pharmacists, nurses, and/or care managers in conjunction with physicians, conduct most of the visit (Beliard & Merrey, 2017; Galvin et al., 2017; Sewell et al., 2016). Other strategies involve active patient recruitment by ancillary staff, and raising awareness by educating Medicare patients when they are in the office for other reasons (Bluestein et al., 2017; Cuenca et al., 2012). It was also observed that small provider practices have the agility to increase their AWV appointments significantly simply by the primary health care provider's level of motivation to participate (Ganguli et al., 2018).

Current Status Quo

When the AWV is not approached strategically, it can easily be drawn out into a long and arduous process. Medically and socially complex patients require considerably more time and effort to complete the form because all conditions must be addressed leading to excessive documentation and follow-up (Ganguli, 2018). Often the onus of that follow up is placed wholly on the provider easily requiring an exorbitant amount of provider time on one patient.

Implementing the AWV is only the first step in healthcare prevention. Changing behavior in rural healthcare populations is the ultimate goal, but existing belief systems can stand in the way of behavior change. Malcom et al. (2020) uncovered the salient belief systems that contributed to poor AWV outcomes. The researchers found that existing poor health, physical limitations, lack of transportation, familial and social support, and knowledge deficits in health literacy all contributed to disparities in access to the preventive care plans (Malcolm et al., 2020).

Health Equity in Healthy Aging: A Desired Future State

The ideal utilization of this tool is to employ the AWV as a gateway to a preventive care model. This model would use nationally recognized, evidence-based prevention strategies to guide personalized prevention plans. Further, the AWV appointment would be used to carve out time to address the patients' specific needs and future health goals, as well as to forge trusting patient-provider relationships. But increased utilization of the AWV is not enough to have a meaningful impact on health outcomes. While research is demonstrating improved use of health screenings and a modest lowering in healthcare costs, several studies have shown little to no effect on overall healthcare improvement and outcomes as of yet (Beckman et al., 2019; Fowler et al., 2018; Ganguli et al., 2019). As previously stated, one major reason for this problem could be that the AWV is not reaching the populations that need it the most; the underserved, physically frail, low-income, and those living in rural areas are the least likely to

receive an AWV (Ganguli et al., 2018). So, the first step in improving healthcare outcomes with the AWV would be to reach these populations.

Because the Medicare AWV is such a comprehensive health evaluation tool, it is inherently complex to administer, particularly in a patient population with a heavy economic and disease burden. That being stated, this is the population who stand to benefit most from a close relationship with a reliable healthcare provider who can address their physical, psychological, and social needs. The apparent difficulties of administering the AWV in rural healthcare are not universally prohibitive to successful implementation. Motivated providers, team-based approaches, and improved workflows have all demonstrated markedly improved adoption (Bluestein et al., 2017).

Internal Evidence

A FQHC organization serving 12 rural and underserved communities has a need to improve their Medicare AWV utilization. Internal data was obtained from the population health coordinator of the organization as well as documents from recent Continuous Quality Improvement (CQI) meetings. This facility has 10,405 Medicare recipients in their patient population. In 2019, only 631 of those patients received a Medicare AWV. Being a safety-net facility, they provide a sliding-scale fee schedule, treat Medicare and Medicaid patients, as well as the uninsured. As a FQHC funded facility, they can only operate in underserved areas and their patient population includes a large percentage of high-risk, medically complex, low health literacy, and impoverished patients. They have prioritized improved utilization of the AWV as a top-quality improvement initiative. As with other rural healthcare organizations, they bear a greater disease burden than do urban and metropolitan serving healthcare organizations. With this FQHC organization, the real barriers to the first desired increase from 6%-12% in the year 2021, are a matter of provider time, workflow, and billing confusion. The culmination of this evidence has led to the PICO question: “In a rural FQHC organization, does a consistent

predetermined workflow strategy combined with a team-based approach to the Medicare AWV, compared with current practices, improve Medicare AWV utilization?"

Evidence Synthesis

Search Strategy

An exhaustive search was conducted using multiple electronic databases to answer the PICOT question. The databases selected included PubMed, PsycINFO, CINAHL, and Cochrane Library. The first three databases were chosen for robust yield of pertinent research on the subject of Medicare Annual Wellness Visits. The Cochrane Library was included to assess whether there had been any large-scale meta-analyses on the subject; there turned out to be none.

Inclusion Criteria, Exclusion Criteria, and Limitations

The inclusion criteria for all databases consisted of studies that encompassed quantitative research, qualitative evaluations, clinical guidelines, and grey literature. This research covered investigations regarding utilization patterns of the AWV, barriers to its implementation, and solutions to common impediments. Excluded research included quantitative research articles published earlier than 2015, AWVs conducted in venues other than primary care facilities such as nursing homes, and research that did not address utilization practices. The AWV is only conducted in the United States, so no research was conducted in other countries, or in any other languages than English. In terms of limitations, the AWV has only been available since 2011 consequently, there is a finite amount of research available to show trends in utilization, therefore in each database there were less than 100 articles regarding AWV utilization and they were largely redundant.

Keyword Selection

A multitude of keywords relevant to the topic were compiled. They included: *Medicare Annual Wellness Visit, AWS, utilization, federally qualified health centers, rural populations, underserved, underinsured, adopters, non-adopters,* and *reluctance*. These words were

combined in several Boolean combinations. However, due to the limited amount of research on the subject, the key terms that revealed the best results were *Annual Wellness Visit* in quotes with OR *AWS* in quotes. Any of the above-mentioned modifying terms yielded either fewer of the same results or thousands of irrelevant articles. It proved more efficient to cast a wide net with just the *"Annual Wellness Visit" OR AWS*. That strategy produced approximately 125 articles in both PubMed and CINAHL which seemed to encompass the entirety of the subject. The use Medical Subject Headings or MeSH terms proved ineffectual for the same reasons the other search combinations did not provide additional results.

Search Yield

A PubMed search using the terms "*Annual Wellness Visit" OR AWV* yielded 130 articles many of which were pertinent to the topic of research. When the modifier "AND *utilization"* was added, 408 articles were produced which included the 130 articles from the first search but no additional articles that were pertinent to the topic. Ultimately, 46 articles were selected for review and 10 were analyzed through rapid critical appraisal. The best search combination for PsycINFO was also "*Annual Wellness Visit" OR AWV*. It yielded 26 articles which consisted primarily of articles regarding how the AWV is being used in cognitive impairment, dementia, depression, and mental health. Of those 26 articles 5 were retrieved for the value of their findings which justify utilization of the AWV in elderly populations. The CINAHL database search also yielded the most successful results with the terms "*Annual Wellness Visit"* OR "AWV". This search produced 106 results many of which were the same as PubMed, though 4 additional qualitative articles were found and utilized for the value of their findings regarding patient and provider perceptions of the AWV. Grey literature was found to be useful when searching organizations that dealt specifically with rural healthcare such as the About Rural Healthcare website and the Rural Information Hub website. These sites provided information about the unique challenges in rural populations in obtaining healthcare.

Synthesis of Relevant Literature

The ten studies retrieved for this review included multiple variations of retrospective cohort designs. To date, there are no prospective randomized controlled trials investigating the Medicare Annual Wellness Visit. However, all the selected studies compared an experimental group (AWV recipients) with a control group (Medicare nonrecipients) while assigning the two groups to represent comparable demographics. Most of the studies used national Medicare patient files selected randomly to assemble their patient populations, with two exceptions. Beckman et al., (2019) used a patient population derived from two unidentified ACOs. Chung et al, (2017) derived its participants from a large mixed-payer outpatient healthcare organization. All ten studies concentrated their research on fee-for-service Medicare and Medicaid patients. No research to date has examined Medicare Advantage (HMO/PPO) populations specifically (see Appendix A, Table 1). All the above referenced studies shared a Level of Evidence (LOE) of IV. This was the highest level of evidence used to study the AWV. However, the number of patients included in the cohorts were quite large and ranged from 8971-845,318. In addition, the amount of information available from the CMS files was robust and made it possible to closely match the experimental groups to the control groups reducing confounding variables.

In terms of demographics, most studies turned up approximately 80 percent non-Hispanic White populations when accessing a random pool of Medicare recipients from the national database. Most studies indicated a vast underrepresentation of non-White ethnicities, rural populations, and lower socio-economic status in terms of AWV utilization and subsequent health screenings. Ages of subjects ranged from 65-85 years, with a mean of 75 (Appendix A, Table 1).

The research questions addressed by these 10 studies examined the impact of the AWV on healthcare covering multiple subjects. First, AWV utilization was surveyed by primary provider characteristics i.e., rural vs. urban, high-risk vs low-risk patients, ethnic minority populations vs. non-Hispanic White populations, and by level of income. Healthcare quality and

cost was assessed in multiple studies, and it was measured by number of hospitalizations, Emergency Department visits, and patient out-of-pocket costs from subsequent referrals and screenings (Appendix B, Table 1).

Most of the researchers used the data analysis tool appropriate to the retrospective cohort design namely the difference-in-difference regression model. The benefit of this tool is that it analyzes both pre-treatment and post-treatment outcomes as well as the differences in outcomes between the two groups. In addition, most researchers employed a multi-level logistic regression model due to the multiple dependent variables to determine a functional relationship between the AWV and the outcomes of interest. Lastly, the Charlson Comorbidity Index was commonly used to match the level of comorbidity in the experimental and control groups (see Appendix A, Table 1). This was vitally important to ensure the level of risk for each cohort was comparatively similar.

Conclusions from the Research

The overall culmination of the evidence demonstrated that utilization of the AWV is showing some modest increases in terms of overall recommended healthcare screenings across multiple ethnicities. The significant increases included advance directives, mammography, vaccines, and abdominal aortic aneurysm screening. However, most of the health screening increases were observed in people who were Caucasian, financially secure, health literate with fewer comorbidities. The evidence also supports that this group of people would have had these types of screenings without the AWV (Ganguli et al, 2018; 2019; 2020). Further, most of this testing was limited to Medicare fee-for-service patients, excluding the entire contingent of Medicare Advantage patients who belong to PPOs or HMOs. This factor alone may skew the overall outcome data because these plans are less expensive for people who cannot afford supplemental Medicare insurance coverage. This disparity in the research may be part of the reason that most recipient cohorts of the AWV lacked ethnic diversity.

According to the framework developed by the Centers for Disease Control (CDC) in conjunction with the Centers for Medicaid and Medicare Services (CMS), the purpose of the AWV was to reduce health disparities, improve health outcomes, and encourage their beneficiaries to take an active role in managing their health. This was intended to be carried out by healthcare providers by implementing a comprehensive health risk assessment, identifying modifiable risk factors, and a subsequently following-up with behavior change interventions (Goetzel et al., 2011). However, the literature consistently revealed the most medically underserved communities were the least likely to receive an AWV, and the overwhelming consensus among researchers agreed that the AWV needs to be directed to people most affected by the social determinants of health (Beckman et al., 2019; Camacho et al., 2017; Chung et al., 2018; Ganguli et al., 2018; 2019). Because the AWV bears no cost to the patient and reimburses the provider competitively, it has the potential to close the gaps in health disparities while creating revenue for healthcare organizations. This is assuming that the AWV is used in the way it was intended, as a health risk assessment and a personalized prevention plan.

The evidence overwhelmingly demonstrated three major areas of need: lack of delivery to underserved populations, lack of a feasible delivery system, and insufficient patient follow-up. These aspects led to the creation of this Doctor of Nursing Practice (DNP) project. The primary aims of this project are three-fold: to create a user-friendly delivery system for the AWV, to build patient awareness of the AWV, and to implement a tangible follow-up plan to that enables patients to take part in their own healthcare prevention.

Theoretical Framework

The implementation of this project requires a theoretical framework that maps out a method for creating a culture shift within an organization. This DNP project includes a change in workflow for multiple interdependent work groups within a pilot healthcare clinic. Therefore, Kotter's Eight Step Model for Managing Successful Change was chosen for its comprehensive approach to collaborative innovation (Kotter, 1995). The eight steps fall under three major

stages: creating a climate for change, engaging and enabling the organization, and implementing and sustaining change (Dawson & Andriopoulos, 2017).

To create a climate for a culture change, the first three steps are implemented by: creating a sense of urgency, building a coalition, and formulating a strategic vision (Kotter, 1995). To do this, the DNP student held a meeting with the pilot office for an information gathering lunch. The purpose was to gather feedback from these employees and to understand the challenges they face with the AWV. This served to align the vision and expectations of the office culture with the proposed workflow change. At the same time, a subgroup of employees was identified as influential early adopters to help promote the workflow change from the inside the organization. To create a sense of urgency, a PowerPoint presentation was given to the entire office during a series of lunch meetings. The presentation was geared toward addressing how the AWV benefits their patient population and how the AWV can make a meaningful impact in the lives of their patients. Further, the presentations demonstrated how the staff can use this project to strengthen interoffice communication and multidisciplinary understanding. Lastly, the presentations demonstrated how the AWV helps their FQHC to meet national objectives and a revenue producing sustainable workplace.

The second major stage to Kotter's model involves engaging and enabling the organization to make the change. This accomplished by establishing buy-in, empowering action, and creating short-term wins (Kotter, 1995). The DNP student designed new workflows along with a patient awareness campaign as part of the intervention. The workflows were targeted at the front office personnel, the medical assistants, and the healthcare providers. During the creation of this process, the DNP student worked closely with the medical providers, office manager, and medical support staff to ensure the workflows would benefit the employees and improve upon the current implementation process. The purpose of this was two-fold. First, it created buy-in on the part of those implementing the changes, and second it created a workflow that was customized to the unique needs of the office.

The final two stages of Kotter's model involve implementing and sustaining the intervention. Kotter describes them as "Don't let up" and "Make it stick" (Kotter, 1995). The idea behind the first idea is to consolidate what works and cull the aspects that do not. These stages occur when the intervention is working and makes logistical sense. At this point, the organization creates a framework that will endure changes in office dynamics such as employee turnover and policy changes. Finally, the intervention is made sustainable by anchoring the change within the organizational culture. Ultimately, these last two steps can only be implemented over time and necessitate buy-in of the organization at every level. Consequently, they will ideally be implemented by legacy projects designed to codify the parts of this project that proved beneficial. The scope of this project has a finite timeline and is designed to be the genesis of a much larger undertaking which is to create meaningful change that enables the healthcare organization to shift to a wellness model where the AWV is a baked-in part of daily operations.

Implementation Framework

Because the nature of this project is a multifaceted quality improvement (QI) initiative, each step of the process will need to be assessed and validated before moving forward. For this reason, the Plan-Do-Study-Act (PDSA) model for QI is appropriate. The PDSA model identifies one strategy at a time, tests it out on a small scale, measures the outcome, and analyzes if the solution addresses the problem (Institute for Healthcare and Improvement IHI, 2021). Because there are several reasons why patients in rural areas do not seek out the AWV, the identified barriers need to be addressed individually and in a systematic way. Doing this provides an evidence-based foundation for change (Institute for Healthcare and Improvement IHI, 2021).

This framework begins with the "plan" phase. In this phase the QI team is assembled and opportunities for growth identified. Further, a measurable solution is agreed upon as well as a strategy to implement the proposed solution. An example of how this might unfold with the AWV would be as follows. The problem identified is lack of patient awareness of what the AWV

is and how it benefits them. The proposed solution might be the electronic medical record will be set to flag all potential Medicare beneficiaries when they come in for a problem visit. The MA and provider are notified and include a screening question on the patient intake form, "Have you scheduled your Medicare AWV? Would you like me to explain this no-cost benefit provided by your insurance company?" The second step of the model is to "do". In this phase, the proposed solution is implemented in one medical office for a specified time-period. The third step "study" is to analyze if the solution resulted in a measurable increase in AWV appointments. In the last step, "act", the solution is either implemented on a broader scale if it proved successful or analyzed for information that was uncovered that contributed to its failure. The process would then start over with a new approach to the same barrier if it was unsuccessful, or the successful solution is implemented in say three medical offices "do" and subsequently analyzed "study" to see if the solution continues to be effective (IHI, 2021).

Implications for Practice Change

The Medicare AWV presents a unique and to-date untapped opportunity to address health disparities in rural communities. The evidence presented demonstrates that since the ten years since its inception, the current status quo of the AWV is that the majority of Medicare beneficiaries are still not receiving the visit, and those who do are more affluent and health literate. For this reason, the healthcare outcomes have been negligible (Ganguli et al., 2019). There are obstacles on the provider side as well as the patient side, but there are also opportunities for using the AWV as a tool to bridge the gaps in health disparities in rural healthcare practices.

To address the issue, a team-based approach should be implemented within the healthcare office to actively promote and educate Medicare patients about the AWV. The AWV could then be used to uncover and address patient needs and healthcare goals. The key stakeholders in this process would depend on the office dynamics and the potential rolls of each team member. Stakeholders include the Medicare beneficiaries, healthcare providers, medical

assistants, care coordinators, pharmacists, behavioral counselors, community organizations, health educators, QI team members, and members of the community that house the healthcare facility. The US Centers for Medicare and Medicaid Services as well as Medicare PPO and HMO organizations are stakeholders as well because the AWV provides them with data to assess patient risk and initiate preventive care.

Potential Outcomes

Incorporating the Medicare AWV as a priority initiative in primary care, creates a gateway to healthcare access for patients who have previously been left out of the healthcare system. A rural FQHC facility is an ideal setting to implement an AWV program aimed at connecting patients with resources, forging long-term healthcare relationships, and creating a healthcare practice with a prevention-based emphasis. Historically this type of model leads to a more stable patient population. The patients receive a health plan that goes beyond health screenings and questionnaires and delivers community support, health education, life resources, and the power to manage their health and well-being.

Methods

Population and Setting

The participants for this study were recruited from an FQHC healthcare office in Southwestern United States. They included physicians, nurses, medical assistants, front office staff, referrals, care management, behavioral services, and the office manager. Because the implementation of the AWV is an interdependent office process, only the employees excluded were from the dental office. At this point, patients were not involved because the first step in this process was to create an efficient mechanism by which to conduct the AWV. The core AWV consulting team was formed by asking for volunteers during a lunch meeting at the pilot office during the planning phase. Subsequently, the fully developed intervention was presented to the entire office staff over two lunch meetings. During this time, the employees were provided information about the intervention and invited to participate.

Project Description

The evaluation question posed by this project asks: does the implementation of a standardized collaborative workflow approach improve the utilization and efficiency of the AWV in a rural healthcare clinic? The proposed project addresses the gap in utilization by first uncovering the unique barriers to its implementation. This will be done by using a bottom-up approach to solving those problems in the form of relevant information gathering at the clinic level.

The project was implemented in a sequence designed to first understand the specific needs of the clinic and then to design a workflow based on the information gathered at the point-of-service (POS) level. The first step was to choose a clinic site with staff members willing to become part of the AWV implementation team. The team was created with a member from each department that plays a role in the AWV. They were then queried about the needs pertinent to their location. This meeting included a presentation of current relevant data regarding the AWV as well as evidence-based strategies for successful implementation in rural healthcare. During this meeting information was collected about how the AWV is perceived by the team as well as their input about what works and what does not.

The next major objective was to propose a solution based on the needs of the office. Workflow changes for the healthcare providers, medical assistants, and front office were proposed based on what the team members expressed would make a meaningful difference. The workflow was written up clearly defining the roles for each department. At the same time, the DNP student functioned as a workflow educator, periodically checking on the office throughout the intervention to assess for buy-in, and/or uncover potential barriers that came up. The intervention took place over a defined 6-week period.

The feedback received from the interoffice team yielded two specific areas to be addressed. The first was the need for a clearly defined and a common-sense workflow. The second area addressed the lack of patient awareness. These two barriers to implementation

were consistent with the barriers observed in the literature with regards to rural healthcare. Consequently, a strategy for improving patient understanding was an integral part of the intervention. Specifically, the office staff expressed how patients viewed the AWV as a nuisance, and they did not seem to understand how it benefitted them. Consequently, patient awareness strategies were incorporated into the three workflow adaptations. In addition, a common language for describing the AWV to the patients was established through scripts created to address common issues regarding the AWV. The scripts were handed out at the beginning of the intervention and were intended to be used as a guideline for how to characterize the AWV to the patients as a personal prevention plan.

The New Workflow

The front office staff were responsible for identifying Medicare patients who came in for acute visits. Once identified, they would provide them with a patient-facing handout describing the AWV, what to expect, and how it benefits them. The front office person would then either schedule the AWV at that time or inform the medical assistant that this Medicare patient would like more information on the AWV from the provider. This is the extent of changes made to the front-office workflow.

The medical assistants (MAs) have two major workflow changes. The first is about building patient awareness. For acute care Medicare patients identified by the front office, they were asked to inquire if the patient had any specific questions about the AWV. These personnel were provided with specific scripting appropriate to their level of expertise on how to educate patients on the AWV. Additionally, because these employees often conduct the health history portion of the AWV, they have a singular ability to describe the specifics of how the AWV is conducted. The second change to the MAs workflow was to inform the healthcare provider that the Medicare patient was eligible for an AWV. The provider could then pick up the educational story from that point.

The healthcare providers portion of the patient education program is to simply recommend the AWV to the Medicare patient who is there for a problem visit. The providers were also provided with guidance within their workflow changes regarding how to present the AWV as a key factor in healthy aging and an improved quality of life. The workflow changes to the healthcare provider were intended to limit the interaction to an interpersonal interpretation and recommendations regarding the health risk assessment and ensuring problem list in the chart was up to date and all current problems were being addressed. The patient would then be provided with a folder containing a one-page list of health screening recommendations, a booklet on advance directives called "The Five Wishes", and any specific patient education materials the healthcare provider deemed pertinent.

Project Timeline

The initial six-week intervention of the DNP project took place during the months of November and December 2021. This timeline was subsequently extended due to a delay in the printing of the patient brochures. Additional IRB approval was obtained to extend the intervention to include the brochures. The brochures arrived in February 2022. Consequently, the front office personnel were reeducated on the brochures by the DNP student, and the intervention was extended through the month of February. Prior to its implementation, approval for the intervention was received in August of 2021 by the Arizona State University International Review Board. During the months of September and October of 2021, the DNP student created patient information materials and workflows which were reviewed, edited, and approved by the FQHC organization. The pre-intervention survey link was distributed via interoffice email on November 9, 2021, to all employees who signed the consent form. The intervention itself took place from November 10, 2021, to December 22, 2021. On February 21, 2021, the post-intervention survey link was distributed via interoffice email to all employees who chose to participate including employees hired during the intervention period. The pre-intervention survey was reconciled and analyzed over the week of November 15, 2021, to

November 22, 2021, and the post-intervention survey was analyzed in the second week of March 2022. The quantity of AWVs conducted during the 6-week intervention period was collected from the FQHC records and compared to the 6-weeks prior to the intervention during the month of January 2021.

Data Collection and Instrumentation

The project was analyzed in several ways. AWV utilization was assessed before and after the 6-week intervention using electronic medical record (EMR) data collection using AWV billing codes. The RC survey was given to all members of the interdisciplinary team in the office including front office staff, billing, providers, MAs, care managers, behavioral specialists, referrals and office managers (Gittell et al., 2010). Each member of the office was given a consent form that includes notification of voluntary participation in the project, protection of anonymity, and a full description of the project goals and particulars. Once consent was received, each participant was assigned a number to protect their identity. The surveys were distributed via email prior to the intervention, and roll-out data was submitted anonymously to a central database. The survey results were then converted to an Excel spreadsheet with only numbers as identifiers. After the intervention completion, the same process for survey implementation was repeated, the surveys were emailed, completed anonymously in an online service, and then the results converted to an Excel spread sheet. This survey was then assessed as to the effectiveness of the intervention and workflow on improving interprofessional collaboration in terms of communication, shared knowledge, problem solving, interprofessional understanding, and shared goals between the team members. There were some survey questions added on to the end of the survey to assess opinions about the intervention, as to what worked and what did not. This data was used to provide descriptive analysis for the FQHC to provide insight into effective workflows that could be standardized across the organization. It also was intended to inform the direction of future projects for the AWV.

Potential Barriers

There are several possible logistical, psychological, and technical barriers to the implementation of the project. First, the EMR may not be equipped to accommodate streamlined changes proposed by the AWV team. For this barrier, the IT department could play a role in enabling the EMR system. Second, a new workflow can be viewed as onerous by the people expected to implement it. Therefore, it is critical to create buy-in for the project. Lastly, Medicare patients may not be aware of the need for the AWV and could resist scheduling one. Therefore, patient education and promotion may be a necessary precursor to active patient participation. However, as the primary goal will be to streamline the workflow process, the primary outcome we will be measuring is efficiency rather than overall increase in usage for this initial stage of the process.

Ethical Considerations

The International Review Board for Arizona State University approved the project methods under exempt status in September of 2021. The anonymity of the project participants was protected and respect for persons observed. Each member of the office was given a consent form that includes notification of voluntary participation in the project, protection of anonymity, a full description of the project goals and particulars. Once consent was received, each participant was assigned a number to protect their identity. The consent forms were distributed prior to emailing the pre-intervention survey at the initial launch meeting. The results from the survey were collected anonymously using a Qualtrics™ survey technology which was programmed to deidentify the IP address of the user. The survey results were then converted to a spreadsheet and then analyzed using Intellectus™ software. After the intervention completion, the same process for survey implementation was repeated. The anonymity of the participants is tantamount to accurate data collection, so the survey was distributed to all relevant team roles in the office (i.e. MA, FNP, office manager) but no names or demographic information was collected. In terms of patient information, the only data that was collected were the CPT codes identifying the number of AWV before and during the intervention.

Budget and Funding

All funding for this QI intervention was provided from the FQHC organization. The details of the budget, sources of funding, cost benefit analysis are summarized in Appendix C, Table 1. The costs of the patient promotional material amounted to $130.00, which came out of the FQHC marketing budget. The licensing fee for the survey was $50.00, which came out of a HRSA quality grant through the FQHC. The FQHC also provided three lunches for the staff of the pilot office given to educate the staff on the details of the intervention. Though no employees were required to work any extra time because of the intervention, they were educated on the new workflows during their regular work hours and were paid their normal compensation. The post evaluation analysis from Brandies University cost $70.00. The overall approximated cost of the intervention is $950.00. However, if the projected revenue created by increasing the number of AWVs from 32 visits to 60 visits during the six-week period, the resulting income would range from $6,400.00 to $8,000.00. This amount will depend on the percentage of patients who have a Medicare Fee for Service plan or a Medicare Advantage plan.

Results

Outcomes

Interoffice Collaboration

The RC survey which evaluated communication, collaboration, shared knowledge, professional respect, and efficiency between interoffice departments was evaluated by creating numeric mean scores that correlated to the Likert value on the survey. These scores were evaluated on Intellectus software using descriptive summary statistics for interval and ratio variables by department. This created a way to cross-reference the department answering the question with the department about whom the question was asked. These data were then put into a matrix for each of the seven questions asked, which was a format that allowed for evaluation of strength of the association between departments. A score of less than 3.5 indicated a weak association, 3.6-3.9 indicated a moderate association, and greater than 4.0 indicated a

strong communication. The individual questions and overall communication score matrices listed in (see Appendix D, Tables 1-8).

Though the RC survey was given before and after the intervention, differences between the pre and post data could not reach statistical significance because there were 6 or less people in each department and the *n* was too small for each subdivided category. However, repeating the survey demonstrated consistent communication trends between departments. The pre and post RC scores were similar in most categories before and after the survey indicating that the workflow intervention did not seem to impact the overall collaboration or communication between departments. In both surveys the front office staff reported a weak communication association on all parameters between the front office staff and the MAs and providers (see Appendix D, Table 8). The MAs reported a similar weak overall communication score with the front office. The strongest overall communication/collaboration was between providers to providers and providers to MAs (see Appendix D, Table 8). The individual questions from the RC survey are broken down in Appendix D Tables 1-8.

The front office staff (PRR) reported a positive trend evident in the post intervention survey with regards to respect for work. Question 7 asked how each department respected the work they do regarding the AWV. Before the intervention, the front office staff reported an average score of 2.00 (rarely) from the MA/RN department. After the intervention, the front office staff reported an average of 3.00 (occasionally) from the MA/RN department. In addition, the PRRs reported an improved respect for their work from fellow front office staff from pre-intervention 2.00 (rarely) to post intervention (3.00) occasionally. To determine if these differences had a statistical impact, a non-parametric two-tailed Mann-Whitney *U* Test for Q7_Respect for PRR by other front office personnel pre versus post was conducted. The result of the two-tailed Mann-Whitney *U* test was not significant based on an α of .05, $U = 2$, $z = -0.61$, $p = .543$. The mean rank for group Pre was 2.50 and the mean rank for group Post was

3.33. This suggests that the distribution of Q7_Respect_PRR for group Pre (*Mdn* = 2.00) was not significantly different from the distribution of Q7_Respect_PRR for the Post (*Mdn* = 3.00) category. Table 1 breaks down the results of this inquiry about how people in this group respect the work you do when asked of PRRs about PRRs.

Table 1

Two-Tailed Mann-Whitney Test for Q7_Respect_PRR by Pre vs. Post

	Mean Rank				
Variable	Pre	Post	*U*	*z*	*p*
Q7_Respect_PRR	2.50	3.33	2.00	-0.61	.543

Note. Question asks PRRs about how other PRRs respect the work they do with the AWV

Patient Information Brochure

Descriptive questions were added on to the RC survey to collect qualitative and quantitative data. Question 11 (Q11) asked the staff how the patients seem to understand the purpose of the Medicare Wellness Visit. This question was asked before and after the patient information brochures were given to the office to use to help educate the patients. A two-tailed independent samples *t*-test was conducted to examine whether the mean responses differed significantly in the before and after categories. The results were significant based on an α of 0.05, $t(32) = -4.14$, $p < .001$, CI 95%, indicating the null hypothesis can be rejected. This finding suggests the mean of Q11 asking if patients understand the purpose of the AWV was significantly different between the Pre and Post categories. The results are presented in Table 2. A bar plot of representing this data is presented in Figure 1.

Table 2

Two-Tailed Independent Samples t-Test for Q11

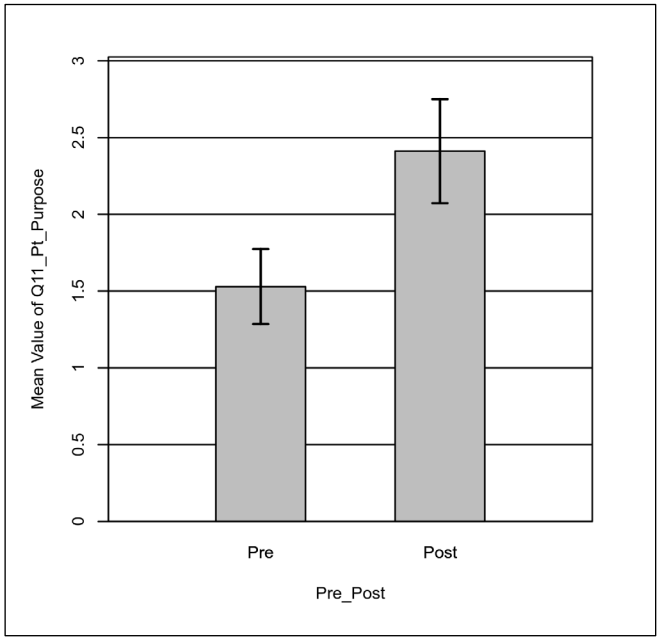
	Pre		Post				
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*	*d*
Q11_Pt_Purpose	1.53	0.51	2.41	0.71	-4.14	< .001	1.42

Note. N = 34. Degrees of Freedom for the *t*-statistic = 32. *d* represents Cohen's *d*.

Note. Question asked the medical staff about patient understanding about the purpose of the AWV before and after the patient information brochures

Figure 1:

The mean of Q11 regarding patient understanding of AWV after patient brochures



Note. Mean value of patient understanding of the purpose of the AWV before and after the patient brochures per the medical office staff. Error bars represent 95% CI.

Qualitative Observations about the Intervention

When medical office staff were asked how they would rate the overall patient response to the patient information brochures, 65% (13) reported the patient education materials were well-received by the patients 25% (5) reported they did not make a difference and 10%(2) did not answer (M 1.55, SD 0.92, Range 1-4). Details are presented in Table 3.

Another post-intervention question asked if the patient education materials made it easier to discuss the AWV with the patients. Responses were 60% (12) answered "Yes", 20% (4) answered "Somewhat", and 20% (4) answered "other" (M 1.80, SD 1.17, Range 1-4). No one responded to the question with a "No". Details are represented in Table 4.

Table 3

Survey responses to question about impressions of the new workflow after the intervention

Field	**Minimum**	**Maximum**	**Mean**	**Std Dev**	**Variance**	**Count**
How would you rate changes made to the workflow for the AWV? (Example: patient education materials, discussing the visit with patients, follow up packet?)	1	4	1.55	0.92	0.85	20
Answer	%	Count				
Educational materials were well received by patients.	65%	13				
Educational materials did not make a difference.	25%	5				
Educational materials were not well received.	0.00%	0				
Other… please explain	10%	2				
Total	100%	20				

Table 4

Survey responses to question about how the patient brochure and facilitated AWV discussion

Field	**Minimum**	**Maximum**	**Mean**	**Std Dev**	**Variance**	**Count**
Did the patient education materials make it easier to discuss the AWV with patients?	1	4	1.8	1.17	1.36	20
Answer	%	Count				
Yes	60%	12				
Somewhat	20%	4				
Not at all	0%					
Other… explain	20%	4				
Total	100%	20				

Question 12 of the post-intervention survey asked a free text question, "What worked well with the Medicare Wellness Visit Patient Education Project?" The responses are listed in Table 5. Question 13 asked, "What kind of changes could be made to improve patient understanding of the Medicare Wellness Visit?" The responses are listed in Table 6. Question and 15 asked for any other observations the staff might have for improving the AWV. The answers to Question 15 are represented in Table 7.

Table 5

Open-ended survey post-intervention responses regarding what worked well

What worked well with the Medicare Wellness Visit Patient Education Project?
• If people took the time to read through the material, it did make the appointment go a little quicker.
• I liked the North Country pamphlet they could take home and read paperwork all together with the 5 wishes.
• Helping patients understand what a Medicare wellness visit is
• Having a knowledgeable student to help and educate our staff and patients
• I had proper verbiage to use so there was less confusion
• Better educated to pass info to patients
• We were better informed of what a Medicare Wellness Visit is
• What worked well was getting other MAs involved, well, somewhat. I push for these along with my provider constantly and I ask other MAs if they do these. Other MAs state they never get asked to do these and before the education project, they had no idea what it was for.
• I learned new things and was able to make it more clear to patients
• Greater awareness
• The patients are more apt to make an appointment because they understand why it is important.

Note. Open-ended responses from medical office staff after the AWV intervention to question 12

Table 6

Open-ended post-intervention survey responses regarding intervention improvement

What kind of changes could be made to improve patient understanding of the Medicare Wellness Visit?
• Have MA and patient's fill out all of the wellness measures before seeing physician
• Sharing the knowledge we have with our patients
• Semi Annual visits from Medicare Specialist Outreach
• The contact list divided up and shared or even a tele-blast to let people know to contact us
• Handouts prior to visits (by mail) letting the patients know the process and the benefit to them.
• Nothing I can think of
• Possibly keep track of patient's Wellness Visits so we can call them the next year to schedule
• Communication on all levels from insurance especially. From my viewpoint, my provider does an amazing job educating [his/her] patients
• Have it explained to the patient in the beginning of coverage, and let them know what it is for, and why it is so important
• Mailings and TV ads in the lobby
• Make sure that every patient that qualifies, gets the info

Note. Open-ended responses from medical office staff after the AWV intervention to question 13

Table 7

Open-ended post-intervention survey responses about how to improve patient understanding

Do you have any other suggestions on how to improve patient understanding of the Medicare Annual Wellness Visit?
• Not sure at this time
• Not at this time but thank you, the visit was well received
• The more educated the staff is the better we can be prepared to educate our patients
• No
• I feel like if the next year's annual visit was scheduled when they end this year's visit, it would help with the workload of those making the calls and appointments.
• Being told what to expect during pre-visit preps and when scheduling appointment
• No, I think the brochures are working well.
• Just really getting our front office staff involved in understanding why these are important
• nope
• Again, making sure that each patient gets the information and understands it.

Note. Open ended responses from medical office staff after the AWV intervention Question 16

Impact of the AWV intervention

The RC survey demonstrated the office dynamics surrounding the AWV. The three departments most involved with the AWV are the PRR, MA/RN, and healthcare providers. The survey was taken twice by the office staff. Though it did not show statistical differences before and after the intervention, it did demonstrate consistent collaborative trends between departments. The overall results demonstrate a weak relationship between the front office and the MA/RN and healthcare providers, a moderate to strong collaboration between MA/RN and healthcare providers, and a strong collaboration among healthcare providers. The implication of these results is that there is an opportunity for better collaboration efforts between the front office and the MA/RNs and healthcare providers. Whether or not this would translate into more AWV visits would be a good topic for further research.

The qualitative data collected around the patient information brochure was overwhelmingly positive. Staff members appreciated the language that it gave them to discuss the AWV with patients (see Tables 6 and 7). The hypothesis regarding the patient brochures was that they would raise awareness and patient understanding of what the AWV is and why it is important. According to the post-intervention surveys the brochures that hypothesis was supported with statistical significance (see Table 2, Figure 1).

Other aspects of the intervention had a lesser impact. A collaborative workflow between the front office staff, MA/RNs, and healthcare providers was introduced, but the RC survey did not indicate that the new workflow created improved collaboration between departments. Also, there was a patient folder put together designed to provide the patients with a prevention plan after the AWV. The staff did not indicate in the survey that this part of the intervention useful.

Discussion

During the information gathering phase of the intervention, the office staff was interviewed about their perceptions and needs surrounding the AWV. The overarching theme that emerged from these interviews was that patients did not understand the utility of the AWV nor did they know what do expect during the appointment. This led to a great deal of frustration both on the part of the patient and the staff. The patient information brochure was designed to address those issues. It contained information that stated the purpose of the AWV, what to expect during the visit, and how it benefits the patient. It also provided the staff with a common language to use regarding the AWV. The staff reported that the brochures helped to facilitate conversations regarding the AWV. Statistical significance was achieved when an independent samples *t* test was run to assess if the office staff perceived better patient understanding with the patient brochures, indicating that the patient brochures effectively addressed the initial problem of lack of patient understanding of the AWV.

The implementation of a successful AWV program in rural locations is not a well-studied phenomenon. It is a multifaceted process, touched by many different departments which could only benefit from enhanced collaboration. The purpose of the RC survey was to understand the baseline collaboration, communication, shared knowledge, efficiency, and respect between departments regarding the AWV. The workflow intervention was intended to strengthen that collaboration. When the survey was repeated, very few parameters had changed, indicating that the intended workflow was not utilized. This could be because it was implemented by a graduate student, who was not there on consistent basis. Though the workflow was proposed, it was not a requirement, so it did not get the traction it might have if it had been a company directive. The delay in the patient information brochures could also be a factor that contributed to loss of momentum for the new workflow. However, this turned an interesting set-back into an opportunity to build collaborative improvement.

The patient brochures were delayed by several weeks. When they arrived, an educational in-service with just the front office personnel was conducted to remind them of the workflow

and how to use the brochures for any Medicare patient who comes in. During the in-service, the front office personnel were re-educated on the AWV and its importance for the patients. It was also communicated that their role was vital to the success of the AWV. This could be the reason why the post-intervention survey showed that PRRs reported an improved level of respect from every department including their own.

Bluestein et al. (2017) found that patients were more likely to schedule an AWV if the physician recommends it; but this finding was contingent on support from the staff. The researchers also found that when office culture shifted to a collaborative workflow designed to get the patient in front of the provider to discuss preventive care, the number of AWVs nearly tripled (Bluestein et al., 2017). This workflow intervention was based on the Bluestein model. It starts with the front office person identifying the Medicare patient and asking if they have had their AWV. The patient information brochure would then give the PRR a tool to follow up on that question, and then inform the MA/RN of the AWV eligibility of the patient. The MA could either discuss the AWV with the patient or just remind the provider to speak with the patient about the AWV. The RC survey showed a week communication score on all 7 parameters with the MA/RN before and after the intervention, indicating that the new workflow was not adopted by the front office. Interestingly in the post-survey, there were multiple requests for more education about the AWV. It is possible that the staff needed a better foundation of information about the AWV for the collaborative workflow to be successful.

Conclusion

Because this was the first time the AWV was assessed from an experimental perspective, the goal of the intervention was to better understand the dynamics of the AWV in this office, the barriers they encounter, and then attempt to address them by floating possible solutions. It was not the intent at this point to increase the number of visits per se, because that type of study design would not have provided as much foundational information about the nature of the

process. Also, it was not clear what kind of interventions would improve utilization in this organization.

Recommendations for Further Study

Findings from this project revealed that patient information brochures were an effective tool utilized by the office staff. The next logical step would be to evaluate the patient brochures from a patient perspective. This would provide information about if their understanding and expectations were actually improved. It would also be interesting to attempt the workflow proposed in this project as a company directive. The workflow itself was created from a bottom-up perspective that took into account the considerations of the people it affected. It would be interesting to take this bottom-up workflow and implement as a company priority that included periodical reinforcement.

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Appendix A

Table 1

Quantitative Studies

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Beckman et al. (2019) Medicare **AWV** Association with Healthcare Quality and Costs **Country**: USA **Funding**: None **Bias:** researchers are employed by Aledade a network of primary HC consulting group that develops workflow technology. **ACOs** were used to collect data.	Health Promotion Model Inferred *Underpins the purpose of **AWV**	**Design**: retrospective cohort study **Method**: Medicare data collected from 2008-2015 assessing trends in utilization for adopters vs. non-adopters of AWV **Purpose:** to determine the impact of the **AWV** on healthcare outcomes, cost, and quality of care	**N**= 8917 **CG**: n= 4,128 **IG:** n= 4,789 **Demographics:** **Mean age:** 73 **Pt Type**: male - 3941, female – 4976, Medicare beneficiaries from 2 **ACOs.** **Setting:** 2 large ACO primary care networks **Exclusion:** those with missing data, died during study, received	**IV1**: Completion of AWV **DV1**: overall healthcare costs per beneficiary **DV2**: hospitalization /ED costs per beneficiary **DV3:** association with utilization of quality measures **Definitions**:	**CMS claims data for:** Total Medicare Costs Part A category specific costs (hospital care, home health) Part B specific costs (provider/supplier durable medical equipment) Number of ED visits and hospitalizations	Difference in difference regression models, Mixed-effects negative binomial model for total cost Mixed effects ZINB to assess category specific costs Mixed effects logistical regression model for	Hospital acute care cost reduction (IRR = 0.88; 95% CI, 0.80-0.97) Hospital outpatient non-ED cost reduction (IRR, 0.93; 95% CI, 0.89-0.97) Total number of ED visits (IRR, 0.95; 95% CI, 0.78-1.11) *not significant Total number of hospitalizations (IRR, 0.95% CI, 0.78-1.11) * not significant **IG results vs CG results on 16 quality measures** performed: (i.e. fall risk, depression screen, cancer screen,	**Level of Evidence** Prognostic study LOE IV Retrospective cohort study **Strengths**: large study with a comparable control group, objective outcomes measured **Weakness:** sampling limited to two ACOs. This model of healthcare differs from FQHC. ACOs have a substantially higher AWV usage than the national average.

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This may not be representative of other types of HC organizations			an AWV in 2014. **Attrition: n/a** retrospective study **Definitions** **ACO**: a capitated healthcare system that operates on a fixed dollar amount per patient.	**Healthcare cost**: amount of money spent per-member-per-month over 11 months following AWV **Quality measures:** preventive measures within the AWV, i.e. fall risk, health screenings, vaccination usage.	16 clinical quality measures assessed in the AWV Validity verified by R version 3.3.3	quality measures	tobacco cessation, A1C, diabetic eye exams) IG performed better than CG on 7/16 measures. $p < 0.01$	Retrospective non-randomized study has potential for selection bias. **Feasibility:** retrospective cohort study could be reproduced in a different healthcare model such as primary care FQHC organizations. However, it would need a similar workflow design to the ACO Aledade model for it to be generalizable.

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Camacho et al., (2017) The Effectiveness of Medicare Wellness Visits in Accessing Preventive Screening **Country**: USA **Funding:** none reported **Bias:** only used Medicare FFS and excluded Medicare Advantage plans. Observational and retrospective study design. sample population skewed toward older, white, middle income beneficiaries.	**Self-care of Chronic Illness Model** (Inferred) Purpose of study to determine AWV effect on self-care maintenance, monitoring, and management	**Design:** retrospective cohort **Method:** A random sample of Medicare FFS outpatient claims drawn from 2011-2014 comparing AWV recipients to nonrecipients of the same demographics then stratifying by region, SES, age, and social risk. **Purpose:** to examine the impact of health screening rates in AWV recipients vs. non-recipients	**N**= 659,150 **CG**= 586,000 **IG** = 73,150 **Demographics:** mean age: 70yrs SD =13.1 Economic Status = MI (60%), AR/D (15%) Region: MET (66%), R (30%) Gender: female (53%) male (47%) Race: White (80%), Black (10%) **Setting:** random sample drawn from 3.18M Medicare claims in U.S. **Exclusion**: Medicare Advantage beneficiaries **Attrition:** n/a retrospective	**IV:** AWV completion **DV1**: receipt of vaccinations **DV2**: receipt of healthcare screen **DV3**: breast cancer rates **Definitions:** Vaccinations: influenza, Pneumococcal, DTaP Screening: CV, Colorectal, Breast, Prostate, DM, Bone mass Quality Measures	**Screening events:** stratified by age, economic distress, rural status, comorbidity, race. **Recommended vaccinations completed:** between AWV received vs. not received **Validity:** IPTW predictive model used to weight the sample groups against confounders. Statistical interaction tests rejected parallel trends across groups.	Multiple logistic regression Inverse probability weights for multiple groups Covariances balanced by standardized difference scores Kaplan-Meier failure curves used to analyze screening rates Charlson index to assess heterogeneity w/in disparity	**Screening events completed**: CG: 63% IV: 85% P <0.01 In areas of economic distress: CG: decrease from 1.27 - 1.09 IV: increased from 1.66-1.70 CI: 95% AWV improved screening rates in the IV across all demographics: age, SES, R, race, and comorbidities. CI 95% Definition: Screening events included all health screens and vaccinations delivered.	**LOE:** level IV **Strengths**: Large study sample, objective outcomes used, subgroups stratified across multiple demographics **Weaknesses:** largely white demographic, sample population limited to Medicare FFS and excluded Medicare Advantage beneficiaries **Feasibility:** limited generalizability to practices that have large Medicare FFS patient populations. It may not reflect Medicare Advantage practices because they were excluded.

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					P < 0.01 standard for significance			
Chung et al., (2018). Preventive Visit among older adults with Medicare's introduction of AWV: Closing gaps in underutilization **Country:** USA **Funding:** NIH, Agency of HC Research and Quality, HCSRN-Aging Initiative **Bias:** research was likely contracted by the	Theory of Self-care of Chronic Illness Inferred Assumption: illness-specific self-care is influenced by healthcare providers	**Design:** retrospective cohort **Purpose:** to determine if the AWV expansion improves utilization among older adults with comorbidities **Method:** EHR records from a large HCO reviewed for AWV and preventive service utilization before	**N** = 456,281 **CG** = 147,835 (Pre-AWV) **IG** = 308,446 (Post AWV) **Demographics:** Ages: (65-69,70-74, 75-79, 80-85) Male: 40.2% Female: 59.8% Race/Ethnicity: White 64%, Black 13.6%, Hispanic 5.6, Asian 13.8%, other 15% HMO Medicare 19.3%, FFS Medicare 80.7%,	**IV:** AWV availability post 2011 **DV:** increase in preventive care visits for: **DV1**: age category **DV2**: number of comorbidities **DV3**: primary care visit frequency	**Preventive visits** based on billing coding for AWV, initial AWV, and "complete physical exam" **Validity:** Likelihood Ratio Test: Chi-Square = 1548, p < 0.001 stratified sample analyses for Pre-AWV and Post-AWV periods separately	Multi-level logistic regression models Charlson Comorbidity Index	**Overall preventive care visits** **CG:** 19% **IG** = 38% p<0.001 **Age group preventive visit rate** CG 26% IG 42% (65-69) CG 21% IG 41% (70-74) CG 21% IG 38% (75-79) CG 13% IG 31% (80-85) (all p < 0.001) **# of Comorbidities** CG 23% IG 43% (zero) CG 15% IG 35% (one) CG 14% IG 31% (>=two) (all p < 0.001) **Ethnicity**	**LOE IV** **Strengths:** Participants included diverse age and ethnic populations. Includes Medicare FFS and HMO beneficiaries. The same population was used for the control group and intervention group minimizing confounders. **Weakness:** data from a single HC organization, observational data cannot isolate direct effect. Does not analyze rural or underserved populations. **Feasibility:** It is generalizable in that it

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HC organization in the study		and after AWV introduction.	**Setting:** Large mixed-payer outpatient HC organization in California **Exclusion:** Medicare PPO Advantage plans **Definitions:** Pre-AWV is between 2007-2010). Post AWV is between (2011-2016)	**DV4:** Medicare FFS and HMO. **Definitions:** Preventive visits included Initial AWV, subsequent AWV, and complete physical exam.			CG 22% IG 39% White CG 12% IG 34% Black CG 17% IG 32% Latino CG 21% IG 41% Asian (all $p < 0.001$)	shows multiple demographics within a population and their utilization of AWV. However, one geographic location limit generalizability.
Fowler et al. (2018). One-year Effect of the Medicare AWV on Detection of Cognitive Impairment: A Cohort Study **Funding:** Eli Lilly **Bias:** Drug company assisted in study design, but results did not	Uncertainty in Illness Theory (cognitive capacity) Inferred	**Design:** retrospective matched-cohort study **Purpose:** To assess the effect of the AWV on receipt of follow-up cognitive care, diagnosis of mild cognitive impairment and Alzheimer Disease	**N =** 471,409 n = 122,669 EG n = 348, 746 CG **Demographics:** Mean Age: 75.2 Female: 67.9% Male: 32.1% White: 89% Black: 4.8% Asian: 2.7% Hispanic: 1.4% **Setting:** random sample from a National pool of	**IV:** AWV receipt **DV:** follow-up cognitive care DV1: Lab testing DV2: Medications for cognitive impairment DV3: Neurobehavioral testing	**Claims for services related to cognitive diagnostic assessment** **Anticholinergic Cognitive Burden score** in pre and post index period (i.e., Lab tests for TSH, B12, Folate; neuro-	ANOVA SAS version 7.1 $P<0.05$ Charlson Comorbidity Index Wilcoxon rank-sum test for continuous measures $p<0.001$	**TSH test** 40% EG 28% CG $p<0.001$ **All 3 tests (TSH, B12, Folate)** 11.25% EG 7.76 CG $p< 0.001$ **Neuro-psych testing** 0.75% EG 0.55% CG $p<0.001$ **Brain imaging** 10.68% EG 11.78% $p< 0.001$ **Change in ACB score**	**Strengths:** demonstrates the AWV can uncover reversible causes of cognitive impairment. **Weaknesses:** disproportionately non-Hispanic White ethnicity. No correction for demographics such as level of income, access to care, or geographic region. **Conclusions:** the AWV had no effect on

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produce favorable outcome for the drug company. Some of the researchers are employees of Eli Lilly. **Country:** USA		**Method:** 5% random sample from National Medicare beneficiaries and assoc. claims for AWV examined. EG received AWV, CG Medicare recipient with office visits but not AWV.	Medicare recipients. **Exclusions:** Age <65 yrs, Medicare HMO and PPO plans, enrollment after index date, previous diagnosis of cognitive impairment in the year prior.	DV4: diagnostic imaging **Definitions**	psych testing; Brain imaging; Dx of AD; meds for cognitive impairment prescribed)	Chi-squared test for proportions Wilcoxon sign-rank tests for continuous measures $p<0.001$ McNemar tests for proportions	0.06 +/- 1.09% EG 0.03 +/- 1.17% CG $p < 0.001$ **Diagnosis of MCI or AD** 6% EG, 7% CG *results not significant	identification of MCI or AD, but it did identify multiple reversible causes of cognitive impairment such as vitamin deficiencies.
Ganguli et al., (2018) Practices Caring for the Underserved are Less Likely to Adopt Medicare's Annual Wellness Visit **Funding:** A grant from the National Institute on Aging (**NIH**)	**Health Belief Model** (inferred) *those with better overall health were more likely to complete the visit.	**Design:** Quantitative retrospective case-control cohort study **Purpose:** to investigate the reasons rural/underserved practices are less likely to adopt **AWV**	**N:** 50,591 **HC** practices **n:** 40,682 **MET** **n**: 5,315 **MIC** **n:** 1,725 **ST** **n:** 2,869 **R** **n:** 4,346 **HB** **n:** 44, 917 **I** **N:** 4,407,239 Possible Medicare beneficiaries	**IV:** Beneficiary characteristics: age, sex, race, ethnicity, dual-enrollment, patient risk scores **DV1:** Overall **AWV** adoption **DV2:** percentage of	**Practices use of AWV:** Beneficiaries eligible vs. those who received an AWV. **Practice characteristics** (setting, number of providers, patient demographics,	**Practice characteristics** : series of univariate analysis, multivariable linear regression model **Patient characteristics :** patient-level logistic	**Of the 50,591 practices examined** 17.4% completed the **AWV** for eligible patients **(SD**: 25.1%) In 2015: 51.2% were non-adopters, 23.1% were adopters. **Practice characteristics: R** **AWV** adoption was 8.1% vs **MET** adoption 24.4% ($p<0.001$).	**Level of Evidence:** IV retrospective case-control cohort study **Strengths:** large study sample of healthcare practices and beneficiaries with multiple types of primary care practices examined. Objective measures used as outcome parameters. **Weakness:** researchers did not account for non-physicians performing the

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Bias: Did not evaluate **FQHC** due to billing code differences. They evaluated practices by tax ID number not used by **FQHC.** **Country:** United States			**Setting**: primary care practices **Sample Demographics:** Practice types: **MET, MIC, ST, R, HB, I.** Race: white vs. non-white Risk: high vs. low **ACO** participation **EHR** incentive program for **AWV** **Exclusion criteria:** 1st year enrollment in Medicare, **FQHC** organizations	appropriate screening **DV3:** percentage of Neuropsychiatric and functional care. **DV4:** Healthcare use and spending "**Adopter practice"**: practices that provide **AWV** for more than 25% of eligible beneficiaries**. "non-adopter practice**" provided 0 **AWV** for eligible beneficiaries	ACO participation) **Potential outcomes of AWV adoption:** Revenue, $P < .05$ significance SAS version 7.12 used to establish validity	regression model **Adopters vs. non-adopters:** Difference-in-difference analysis (established stability of patient assignment and patient mix)	**HMR** practices **AWV** adoption 18.2% vs **LMR** practices adoption 23.0%. ($p<0.001$) **Adoption for practices** with high % Medicaid enrollment 17.0% vs. low Medicaid enrollment 26.5% ($p<0.001$) **Within practice findings:** Dual enrollment (OR: 0.64), non-white race (OR: 0.95), higher medical risk (OR: 0.77) were all less likely to receive and AWV compared to other patients within the same practice. ($p<0.001$)	**AWV** such as NPs/PAs resulting in a skewed accounting of types of providers performing **AWV**. They did not include **FQHC** organizations. Retrospective studies are subject to researcher bias because researchers may be looking for a particular result. **Feasibility**: this type of study is reproduceable based on the retrospective cohort study, though the magnitude would be quite labor intensive. The results are highly applicable to the patient population in the PICO question i.e. rural, underserved, and large percentage of high-risk patients. However, it is a FQHC organization which was not studied in this research.

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Ganguli et al, (2019) Association of Medicare's Annual Wellness Visit with Cancer Screening, Referrals, Utilization, and Spending **Country:** USA **Funding:** National Inst. on Aging, consultant fees from Haven **Bias:** EG was older, less chronic illness, less ethnic diversity, less dual enrollment.	Theory of Bureaucratic Caring Inferred	**Design:** retrospective cohort using difference-in-difference models **Purpose:** to assess AWV association with improvements in evidence-based screening, referrals, spending.	**N=** 23,665 medical practices n = 15,123 EG n = 8,542 CG **Setting:** National Medicare data from 2008-2015 **Demographics:** no significant differences between age, sex race/ethnicity, and dual enrollment between adopter and non-adopter practices. *breakdown was not provided in the article.	**IV:** AWV adoption **DV1**: cancer screenings **DV2:** Functional/Neuropsychiatric referrals **DV3:** ED/Hospital visits	**Primary outcomes measured:** cancer screenings, referrals, neuropsychiatric and functional issues, ED visits, Hospitalizations, spending, low-value screenings.	Difference-in-difference analysis Bonferroni correction for multiple outcomes SAS version 7.12 Sig = $p < 0.002$	**Use of PT/OT** 0.86 difference (increase) in usage for EG vs CG ($P<0.002$) **ED visits** -2.07 difference (decrease) in the EG vs CG ($p<0.002$) **Mammography rates** 0.82 difference (increase) in EG vs CG ($p<0.002$) **Hospitalizations** -0.30 difference (decrease) in EG vs CG (not significant)	**LOE IV** **Strengths:** examined outcomes of AWV and identified gaps in access. **Weaknesses:** the two groups were not inherently equivalent in terms of practice characteristics. **Conclusions:** measured outcomes between the two groups were negligible. So far the AWV is not reaching the patient populations necessary to close the gaps in preventive care resulting in virtually no overall cost benefit.

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Jiang et al., (2018) The effect of Medicare's Annual Wellness Visit on preventive care for the elderly **Funding:** researchers claim no funding. The primary researcher works for a private human data science company IQVIA in health economics and outcomes research. **Bias:** only included Medicare **FFS** part A and B beneficiaries and not Medicare Advantage patients.	**Self-efficacy and Outcome expectations theory** (inferred) *those with the self-efficacy belief to complete **AWV** will follow through with prevention measures	Quantitative retrospective cohort design Matched propensity scores used to create 2 cohorts with a 1:1 matching propensity score **EG** and **CG** **Purpose:** to assess the effect of receiving an AWV on utilization of 8 Medicare covered preventative services.	**N** = 381,934 patients **n =** 190,967 (**EG**) **n** = 190,967 (**CG**) **Setting:** a 5% random sample of National Medicare part A and B beneficiaries **Sample Demographics** standardized differences between two groups was zero. **EG** and **CG** were one-to-one matching cohorts. Identical 50%:50% numeric matching for **EG** and **CG** in:	**IV:** receipt of Medicare **AWV**. **DV**1: Mammography screening **DV**2: Pap smear test **DV**3: Bone density scan **DV**4: Prostate cancer screen **DV**5: Influenza vaccine admin. **DV**6: depression screen **DV**7: Alcohol screen. "**Annual Wellness Visit**" a fully covered annual Medicare visit conducted by	**6 binary indicators on whether patients receive:** Mammography, pap screen, bone density scan, prostate screen, colon cancer screen, and influenza vaccine. **Secondary outcomes:** Depression screen, alcohol screen. **Propensity score** using a matched cohort indicated small, standardized differences <0.1 for each covariate of observed characteristics	**Pearson chi-square statistic**. Treatment and control groups were matched exactly based on age, sex, and race. Standardized difference is 0 for these groups. **Logistical regression** adjusting for all covariates **Multivariate logistic regression** for each primary outcome	**Mammography** completed: EG 32.5% vs CG 26.4% (OR: 1.63, 95% CI) **Pap Test:** EG 10.3% vs CG 6.6% (OR 1.86, CI 95%) **Bone Density**: EG 18.3% vs 10.8% (OR: 1.99, CI 95%) **Prostate cancer** screen: EG 7.6% vs CG 4.9% (OR: 1.83, CI 95%) **Colon cancer** screen: EG 15.7% vs CG 7.6% (OR: 2.43, CI 95%) **Influenza vaccine:** EG 63% vs CG 56.8% (OR: 1.46, CI 95%) **Depression screen:** EG 1.5% vs CG 0.4% (OR: 4.00, CI 95%) **Alcohol screening**: EG 0.8% vs CG 0.1% (OR 6.15, CI 95%)	**LOE:** IV **Strengths:** large retrospective study conducted in locations across the country. The one-to-one propensity score cohorts minimized confounding variables in demographics. **Weaknesses:** For each cohort :90% of the participants were white, 67% were female. Only 7% of either cohort were Medicaid recipients implying that very few were underserved or experiencing poverty. Medicare managed care patients were excluded so these findings cannot be generalized to them. Data is observational rather than experimental. **Conclusions:** preventive care utilization was significantly higher in the AWV group versus the

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Country: United States			Age category, sex, Race, urban, rural, **Exclusion criteria**: Medicare Advantage Enrollment, first year Medicare Enrollment, anyone who did not have a one-to-one demographic cohort match **Attrition**: due to mortality was < 5%	the medical provider that assesses all chronic illnesses, current medications, functional status, mental status, USPSTF Guidelines prevention guidelines for the individual.				control group in all 8 parameters. Confounding variables for this outcome were minimized by matching the cohorts. So, all things being equal, the AWV may increase usage preventive services. **Feasibility/Applicability:** This study could be easily replicated using Medicare and Medicare Advantage beneficiaries as well as other outcome measures such as number of falls after the AWV. The applicability of the study is limited to Medicare fee-for-service participants, and cannot be generalized to Medicare advantage, underserved populations, or those experiencing poverty.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Lind et al., (2018) Ethnoracial Disparities in Medicare AWV Utilization **Country:** USA **Funding:** Multiple Public Health organizations and Universities in CO **Bias:** participants must be willing to fill out a survey. No randomization in selection of criteria, retrospective analysis subject to researcher selection bias	Population-based approach to Self-Efficacy and Outcome Expectations (Inferred)	**Probit Regression Model** using Medicare Beneficiary Survey **Method:** Medicare Current Beneficiary Survey (2011-2013) **Purpose:** to explain the differences in AWV utilization based on Ethnoracial group, SES, health status and access to care.	**N=** 25,210 **n1=** 2010 **n2=** 1570 **n3=** 1193 **n4**=20,437 **Demographics:** Mean age: 77.6 Female: 56% Male: 44% Ethnicity: n1: Black n2: Hispanic n3: Other race n4 White **Setting**: Medicare Beneficiaries from National MCBS data **Exclusion:** Medicare Advantage beneficiaries. **Attrition**: n/a	**IV1:** ethnicity **IV2:** income **IV3:** education **IV4:** rural residence **IV5**: Comorbidities **DV:** AWV utilization	**MCBS survey:** -Self-reported usage of AWV on -Usual place of care -Emergency Room use - Medicaid enrollment **Validity**: Chi-squared used for sample characteristic comparison SAS 9.4, Stata 14.1	**Probit Regression Model** adjusted for covariates. **Wald test** for Ethnoracial minority groups	**2011 Utilization** Black 4% White 8% Hispanic 7.8% Other 6% (95% CI) **2012 Utilization** Black 8% White 12% Hispanic 7% Other 9% (95% CI) **2013 Utilization** Black 14.2% White 13.7% Hispanic 8.2% Other 8% (95% CI	**LOE:** IV **Strengths:** by using the MCBS survey, info regarding patient motivation for completing the survey could be obtained. Researchers were able to differentiate completion rates of difference ethnicities and then adjust for other confounders like SES, and region. **Weaknesses**: The study is a low level of evidence, unblinded, retrospective. **Conclusions**: non-Hispanic White populations utilize AWV at a higher rate than Hispanic, African American populations even after correcting for income and region.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Misra & Lloyd (2019) Hospital Utilization and expenditures among a nationally rep sample of Medicare FFS beneficiaries 2 years after AWV **Country:** USA **Funding:** Centers for Medicare and Medicaid Services **Bias:** inherent differences between AWV users and non-users in that AWV patients may be more motivated toward prevention healthcare.	Theory of Self-care of Chronic Illness Inferred	**Design:** retrospective cohort **Purpose:** to examine the impact of AWV on Medicare expenditures and hospital-related utilization **Method:** Medicare claims and enrollment data from 2013-2017, 5% random sample of FFS beneficiaries. AWV patients were followed for 2 years after AWV compared with 1:1 matching of control group of like demographics from ACO. **Exclusions:** Medicare	**N=** 456106 n = 228,053 EG n = 228,053 CG **Setting:** sample of Medicare FFS beneficiaries **Sample Demographics 1:1 cohort matching for;** Mean Age: 73.3 Ethnicity: White 86% Black 6.5% Dual-eligibility: 13% Rural: 20% ACO: 24% Utilization costs: comparable for flu vax, office visits, ED visits, total medical expenditures	**IV:** AWV received **DV1:** total Medicare expenditures after 12 mos and 25 mos **DV2:** Acute covered hospital days **DV3:** ED visits	Medicare claims and enrollment data Medicare Healthcare common procedure coding system	**Linear fixed effects regression models** Propensity score matching for balance the groups across covariates Significance $p<0.05$	**AWV usage for FFS beneficiaries:** 2013 13% 2014 15% 2015 19% 2016 22% 2017 24% **Outcomes associated with AWV use** Total Medicare expenditures lower for EG by $122 (95%CI, p = 0.032) ED visits lower for EG p=0.12 *not significant between 2 groups Hospital days: lower for EG but not significant p = 0.84	**LOE: IV** **Strengths:** used a 1:1 cohort comparison to assess the effect of AWV preventive screening on expenditures. Objective outcomes were measured. **Weaknesses:** confounding factors are not observable by claims data (i.e. cognitive function, mental health, functional status). Longer follow-up periods may be needed to determine impact of AWV on hospitalization. Cost reduction was narrowly defined by Hospitalization and Medicare FFS expense. Out-of-pocket was not examined. **Conclusions:** Medicare AWV was associated with a significant reduction in Medicare expenditures for A and B but not for

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
		Advantage beneficiaries						reduced hospitalizations or ED visits.

Key: **ACB** – Anticholinergic Burden; **ACO** – Accountable Care Organization; **AD**- Alzheimer Disease; **AR** – At risk; **AWV** – Annual Wellness Visit; **CG** – Control Group; **CMS** – Centers for Medicare and Medicaid Services; **CV** – Cardio-vascular; **D** – distressed; **DM** – Diabetes; **DV**-dependent variable; **EG** – experimental group; **EHR** – Electronic Health Record; **FQHC** – Federally Qualified Healthcare Organization; **FFS** – Fee for service; **HB** – hospital based ; **HC** – health care; **HCSRN**- health care systems research network **HMR** – high medical risk **I** – independent; **IG** – intervention group; **IRR** – incidence rate ratio; **IPTW** – inverse probability weights; **IV**- independent variable; **LMR** – low medical risk; **MCBS** – Medicare Current Beneficiary Survey; **MCI** – Mild cognitive impairment; **MET** – Metropolitan; **MI** – middle income: **MIC** – Micropolitan; **MRIF** – Medicare Research Identifiable Files; **N**-number of studies; **n**- number of participants; **NIH** – National Institutes of Health; **OR** – odds ratio; **R**- rural; **SD** – Standard deviation; **ST** – small town; **ZINB** – zero-inflated negative binomial

Appendix B

Table 1

Synthesis of Research Articles

Author	Beckman	Camacho	Chung	Fowler	Ganguli	Ganguli	Ganguli	Jiang	Lind	Misra
Year	2019	2017	2018	2018	2018	2019	2020	2018	2018	2019
Design/Level of Evidence	RCS/IV	RCS/IV	RCS/IV	RCS/IV (matched cohort)	RCCCS/IV	RCS/IV	OCS/IV	QRC/IV	PRM/IV	RCS/IV
Study Characteristics										
Setting										
ACO	100%	n/a			15%					24%
M. Adv.			19%							
M. FFS		100%	80%	100%		100%	100%	100%	100%	100%
Dual SNPs	5%						3%	7%	26%	13%
Rural		30%			9%		6%	14%	29%	20%
Urban	100%	66%			91%		86%	85%		
Demographics										
Mean age	73	70	75	75	75	72	72.6	75	77.6	73
Female	44%	53%	59%	68%	n/a	69%	63%	64%	56%	
Caucasian	88%	80%	64%	89%	n/a		91%	91%	81%	86%
Latinx/ Hispanic	2%	n/a	5.6%	1.4%	n/a		2.1%		6.2%	
African American	10%	10%	13%	4.8%	n/a		2.5%	4.9%	8%	6.5%
ES % below poverty line		15%	n/a				30%	X		
Sample Size N=	8971	659,150	456,281	471,409	50,591	23,665	75,275	845,318	25,210	456,106
Measurement										

Key: **ACO** – Accountable Care Organization; **AD** – Alzheimer Disease; **AWV** – Annual Wellness Visit**; COC** – cost of care; **ES** – Economic status; **M. FFS** – Medicare Fee for Service; **HC** – health care; **OCS** – observational cohort study; **PRM** – probit regression model; **QRC** – quantitative retrospective cohort; **RCCCS** – retrospective case-control cohort study; **RCS** – retrospective cohort study; **SNPs** – Special needs plan (Medicaid & Medicare); **VAX** - vaccinations;

Medicare Costs	X					X				X
Hosp/ED visits	X					X				X/X
#Screen/VAX	X	X				X	X			X
Preventive care visits			X					X	X	X
Cog. impairment/AD				X						
Medical risk high/low					X	X		X		
income									X	
Level of education									X	
Rural residence									X	X
Adopter practice characteristics					X					
COC cascade						X	X			
Low value screening						X	X			
Duration of intervention	2 yrs	3yrs	3yrs	2yrs	7yrs	7yrs	2yrs	2yrs	2yrs	4yrs
IV - Interventions										
AWV completion	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
DV – Dependent Variable										
Overall HC costs	↓					↔				↓
# Hosp/ED visits	↔					↔/↓				↔
% of HC screenings performed	↑	↑↑				↑	↑	↑		↑
# of preventive visits			↑		↑			↑		
Healthcare disparity (ethnic)			↓				↑	↑	↑	
Detect Cog. impairment labs/AD				↑/⇔						

Key: **ACO** – Accountable Care Organization; **AD** – Alzheimer Disease; **AWV** – Annual Wellness Visit**; COC** – cost of care; **ES** – Economic status; **M. FFS** – Medicare Fee for Service; **HC** – health care; **OCS** – observational cohort study; **PRM** – probit regression model; **QRC** – quantitative retrospective cohort; **RCCCS** – retrospective case-control cohort study; **RCS** – retrospective cohort study; **SNPs** – Special needs plan (Medicaid & Medicare); **VAX** - vaccinations;

Patient stability					↑					
Adoption by rural/SNPs /minority providers					↓					
# referrals						↑				
Patient COC							↑			
Low value testing							↑			

Key: **ACO** – Accountable Care Organization; **AD** – Alzheimer Disease; **AWV** – Annual Wellness Visit**; COC** – cost of care; **ES** – Economic status; **M. FFS** – Medicare Fee for Service; **HC** – health care; **OCS** – observational cohort study; **PRM** – probit regression model; **QRC** – quantitative retrospective cohort; **RCCCS** – retrospective case-control cohort study; **RCS** – retrospective cohort study; **SNPs** – Special needs plan (Medicaid & Medicare); **VAX** - vaccinations;

Appendix C

Table 1

Budget Projections for AWV QI Project

Phase	Activities	Direct Costs	Indirect Costs	Potential Funding Sources	Cost vs. Revenue Savings
Pre-intervention costs	Staff education costs 5 core AWV team employees 2 hours of AWV planning meetings $12.00/hr		$120.00 *Staff will not be asked to come in outside their normal work hours	NCHC payroll	
Pre-intervention	Staff lunches scheduled for July to discuss AWV program and build AWV team.	$200.00		HRSA Quality Grant from NCHC	
During intervention	Marketing Costs AWV patient handout	$130.00 for 100 patient brochures	$50.00 For 2 hours of Marketing department employee time	NCHC Marketing Department	
During intervention	Relational Correlation Survey licensing fee	$50.00		HRSA Quality Grant from NCHC	
During intervention	"Lunch and Learn" staff information sessions Nov. 8th and 9th	$300.00		NCHC	
Post-intervention	RC Survey evaluation costs	$70.00 post evaluation analysis from Brandeis University Office of Technology and Licensing	<$1,500> (Optional costs for having data evaluated and interpreted through Brandeis University)	NCHC (This extensive evaluation would provide an invaluable insight into the real picture of how workgroup work together)	
Total Costs of DNP project					**$920**
Revenue Savings	If the AWV increases from 32 visits per 6-weeks to the projected 60 visits during the 6-week intervention, with an average Medicare reimbursement of $300 per visit, come out to additional $8400.00 in additional revenue				**$8400.00** in additional revenue projected during the 6-week intervention

Appendix D

Table 1

RC survey question #1

How frequently do people in these groups communicate with you about the Medicare Annual Wellness Visit?

Pre Intervention

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	1.00	2.50	1.00	1.00	1.00	1.50
MA	2.80	3.80	**3.75**	1.50	1.00	1.25	1.50
PROV	2.75	**3.50**	3.50	2.00	1.25	2.00	2.25
REF	3.60	2.80	3.80	3.25	1.80	3.40	2.20

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post Intervention

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.67	1.67	2.00	1.33	1.00	1.67	2.33
MA	2.50	3.33	**4.33**	1.50	1.50	1.67	2.00
PROV	2.00	**3.67**	3.33	1.67	1.33	1.67	2.00
OR	3.00	3.00	3.00	1.50	1.50	1.50	2.50
CM	4.00	3.00	2.00	2.00	1.00	1.00	3.00
REF	2.60	3.00	3.20	3.80	2.00	2.80	1.80

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 2

RC Survey Question #2

Question 2: Do people in these groups communicate with you in a timely manner about the AWV?

Pre Intervention

	PRR	MA	Prov	Ref	BH	OR	OM
PRR	2.55	2.55	2.50	2.50	2.50	2.50	2.50
MA	3.00	3.60	3.50	1.25	1.00	1.00	1.25
PROV	2.25	3.50	2.75	2.25	2.00	2.00	2.00
REF	3.80	3.60	3.25	3.75	2.25	3.25	2.50

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post Intervention

	PRR	MA	Prov	Ref	BH	OR	OM
PRR	3.33	1.67	2.00	1.33	1.00	1.33	2.67
MA	2.33	2.67	3.50	1.67	1.33	1.33	1.83
PROV	2.33	3.67	3.33	1.67	1.33	1.33	2.33
OR	3.00	3.00	3.00	1.50	1.50	1.50	2.50
OM	4.00	3.00	2.00	2.00	1.00	1.00	3.00
REF	2.40	3.00	3.00	4.00	2.00	2.40	2.20

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 3

RC survey question #3

Do people in these groups communicate with you in a timely manner about the AWV?

Pre Intervention

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.55	2.55	2.50	2.50	2.50	2.50	2.50
MA	3.00	3.60	3.50	1.25	1.00	1.00	1.25
PROV	2.25	3.50	2.75	2.25	2.00	2.00	2.00
REF	3.80	3.60	3.25	3.75	2.25	3.25	2.50

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post Intervention

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	3.33	1.67	2.00	1.33	1.00	1.33	2.67
MA	2.33	2.67	3.50	1.67	1.33	1.33	1.83
PROV	2.33	3.67	3.33	1.67	1.33	1.33	2.33
CM	3.00	3.00	3.00	1.50	1.50	1.50	2.50
OM	4.00	3.00	2.00	2.00	1.00	1.00	3.00
REF	2.40	3.00	3.00	4.00	2.00	2.40	2.20

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 4

RC survey question #4

When a problem occurs with the AWV, do the people in these groups work with you to solve the problem?

Pre

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	2.00	2.50	2.00	2.00	2.00	2.00
MA	3.40	3.40	3.25	2.25	1.25	1.25	2.00
PROV	3.50	4.50	4.25	3.00	3.00	3.00	3.00
REF	2.50	3.00	2.50	2.25	1.50	1.75	1.75

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	1.33	1.33	1.33	1.00	1.33	2.35
MA	2.33	2.83	3.40	1.83	1.33	2.00	2.17
PROV	2.60	3.67	3.33	1.33	1.00	1.00	2.17
REF	2.20	2.00	2.80	3.80	1.60	2.80	2.60
OM	4.00	4.00	2.00	2.00	1.00	1.00	3.00

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 5

RC survey question #5

Do people in these groups share your goals with regards to the AWV?

Pre-Intervention

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	2.00	2.00	2.00	2.00	2.00	2.00
MA	2.00	3.20	2.75	1.25	1.25	1.25	2.00
PROV	3.75	4.75	4.75	3.75	3.00	3.75	3.75
REF	4.00	3.75	3.00	3.80	1.50	3.00	3.00

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post-Intervention

	PRR	MA	Prov	Ref	BH	OR	OM
PRR	2.00	1.33	1.33	1.33	1.00	1.33	2.33
MA	1.50	2.50	3.17	1.50	1.33	1.20	1.83
PROV	2.33	4.00	4.33	1.67	1.00	1.67	3.00
CM	4.00	4.00	4.00	4.00	2.50	4.00	4.00
OM	4.00	4.00	4.00	4.00	1.00	4.00	4.00
REF	2.60	3.00	3.00	4.20	1.60	3.00	2.60

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 6

RC survey question #6

Do people in each of these groups know about the work that you do with the Medicare AWV?

Pre

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	2.00	2.50	2.00	2.00	2.00	2.50
MA	2.25	4.00	4.25	2.25	1.50	1.50	2.00
Prov	2.75	4.25	4.50	2.50	1.50	1.75	2.50
REF	3.50	3.75	3.00	3.75	2.75	2.75	3.00

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.67	2.00	1.67	1.67	1.00	1.33	3.00
MA	2.17	3.67	3.83	1.67	1.33	1.50	1.83
Prov	3.33	3.33	4.33	2.33	2.00	2.00	3.00
CM	4.00	4.00	3.50	2.50	2.50	2.50	4.00
OM	5.00	5.00	5.00	5.00	5.00	4.00	5.00
REF	2.00	2.60	2.60	3.60	1.80	2.40	2.20

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 7

RC survey question #7

Do people in these groups respect the work you do with the AWV?

Pre

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	2.00	2.00	2.50	2.00	2.00	2.00	2.50
MA	2.20	3.75	4.00	2.25	1.25	1.25	2.25
PROV	4.00	4.75	4.75	4.00	3.75	3.75	4.00
REF	4.00	4.25	4.50	4.75	3.00	3.00	3.25

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Post

	PRR	MA	Prov	Ref	BH	CM	OM
PRR	3.00	3.00	3.00	2.00	1.00	2.33	3.00
MA	1.67	2.50	3.17	1.67	1.33	1.50	1.67
PROV	3.33	3.67	4.00	3.33	3.00	3.00	3.00
CM	4.00	4.00	3.50	2.50	2.50	2.50	4.00
OM	5.00	5.00	5.00	5.00	5.00	5.00	5.00
REF	4.00	4.00	4.00	4.75	4.00	4.00	4.75

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*

Appendix D

Table 8

RC survey question #8: Combined scores from questions 1-7

Overall Combined Collaboration Scores Pre-Intervention

	PRR	MA/RN	Prov	BH	Ref	CM	OM
PRR	2.07	1.93	2.43	1.93	1.93	1.93	2.21
MA	2.50	3.43	3.54	1.18	1.38	1.29	1.82
PROV	3.14	4.29	4.18	2.51	2.93	2.75	2.93
REF	3.29	3.46	3.29	2.36	3.86	2.86	2.61

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Overall Combined Collaboration Scores Post-Intervention

	PRR	MA/RN	Prov	Ref	BH	CM	OM
PRR	2.62	1.81	1.90	1.47	1.05	1.52	2.57
MA	2.05	2.71	3.57	1.69	1.36	1.11	1.88
PROV	2.67	3.62	3.86	1.95	1.67	1.81	2.57
CM	3.50	3.57	3.29	2.29	2.29	2.29	3.29
OM	4.29	3.86	3.14	3.14	2.57	2.57	3.71
REF	2.57	3.29	3.46	3.75	2.46	3.32	2.89

***PRR** = Front office, **Ref** = Referrals, **MA** = Medical Assistant, **Prov** = Provider, **BH** = Behavioral Health, **CM** = Case Manager, **OM** = Office Manager*

Note.
Departments that deal primarily with AWV
Departments that deal secondarily with AWV
Strong overall communication ***> 4.0***
Moderate Communication ***3.5 – 4.0***
Weak overall communication ***< 3.5***
***Columns** = who the question is about*
***Rows** = person from the department answering the question*