Improving Fall Risk Assessment in Primary Care

Using an Evidence-Based Fall Prevention Protocol

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Abstract

Falls are a leading contributor of morbidity and mortality in the elderly. Even patients that did not suffer an injury limit their daily activities due to a fear of falling. Falls can influence health, quality of life, and medical costs. Current practice recommendations call for assessments and interventions by health care providers to help prevent falls. The Centers for Disease Control and Prevention (CDC) has developed an initiative called Stopping Elderly Accidents, Deaths & Injuries (STEADI) to assist health care providers with implementing fall prevention programs into practice. A quality improvement project was developed to increase knowledge and performance of fall risk management by primary care providers and clinic staff. The designed fall risk management protocol utilized assessment and intervention recommendations adapted from the STEADI initiative. A paired-samples t-test determined that education on falls risk management resulted in a 20.4% improvement in knowledge from 74.9% to 95.3% (t= 5.45, p=.001) among N=8 participants. Patient records were reviewed post-project implementation, and the results show that there was a 100% assessment rate for the patients seen by participating providers during the project implementation period (N=254), with 52.8% of patients identified as an increased risk for falls (N=134). Patients identified as increased fall risk had the fall risk addressed by the provider 94% of the time. The outcomes indicate that the project was successful with increasing knowledge and increasing performance of fall risk management with elderly patients in the primary care clinic used for the project, and the findings support the possibility of sustainability and roll out to other primary care clinics in the medical group.

Keywords: fall prevention, fall risk management, primary care, elderly

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Unintentional falls in the older adult population over the age of 65 is a growing problem. The Centers for Disease Control and Prevention (CDC) has found that one in four older adults has reported falling, and the death rate from falls in the elderly population has risen approximately 30% from 2009 to 2018 (Centers for Disease Control and Prevention [CDC], 2020a). The majority of falls occur at home, and falls are the leading cause of emergency department visits for this vulnerable population (Faul et al., 2016). The medical costs that result from falls is high. In 2015, the medical costs related to falls was approximately $50 billion, with $28.9 billion being paid by Medicare (Florence et al., 2018).

The United States Preventive Services Task Force (USPSTF) produced recommendations for falls prevention in the elderly. The recommendations state that interventions by health care providers are necessary to help prevent falls, these interventions include fall risk assessments completed in the primary care setting to identify fall risk in the elderly (U.S. Preventive Services Task Force [USPSTF], 2018). Implementation of a fall risk management protocol can lead to the identification of fall risk in patients and early intervention by providers. In a study conducted by Southerland et al., the implementation of a fall risk protocol that included a balance test in addition to verbal examination has increased the identification of the patients' fall risk by 20% (Southerland et al., 2016).

A study by Healey et al. (2014) observed the effectiveness of utilizing a fall prevention protocol in the inpatient setting, and the study showed there was a significant decrease in falls on units that had implemented the protocol versus units that had not. The falls prevention protocol assessed in the study not only included an assessment for fall risk but also interventions for

patients identified as fall risk. Evidence suggests that having protocols, which include both assessment techniques and interventions can assist in preventing falls. The development of a comprehensive fall risk management protocol in the primary care clinic setting can be effective in identifying fall risk in the elderly patient population and help prevent falls.

Background

The National Committee for Quality Assurance (NCQA) is an organization that began accrediting insurance health plans in the 1990s. The NCQA utilizes a performance improvement tool called the Healthcare Effectiveness Data and Information Set (HEDIS) to determine provider and health care organizational effectiveness in managing patient health care (National Committee for Quality Assurance, 2020). In 1998, the Centers for Medicare and Medicaid Services (CMS) acted in conjunction with the NCQA to include Medicare recipients into receiving HEDIS quality care initiatives and developed the Medicare managed care outcomes measure. The measure was titled the Medicare Health Outcomes Survey, and it examined various physical and mental health outcomes. In 2006, the fall risk management initiative was added to the Health Outcomes Survey (Centers for Medicare and Medicaid Services [CMS], 2020).

Effective management of the identified HEDIS measures will positively impact the health of the patients but also benefit the health care organization through improved financial compensation. Health care provider reimbursement from Medicare is based on performance of the outcome measures (Cuenca, 2017). A higher performance rating on the measure of fall risk management will result in improved reimbursement.

The CDC calculates that approximately 36 million falls occur annually in the elderly population, with 37% of those falls requiring medical treatment (CDC, 2020a). The medical costs associated with non-fatal falls is estimated at $50 billion annually, and in the state of Nevada the

medical costs in 2014 were $295 million (CDC, 2020a). In response to the health and economic impact of falls in the elderly population, the CDC developed a program called Stopping Elderly Accidents, Deaths & Injuries (STEADI).

The STEADI initiative is designed to help health care providers with implementing a fall prevention program into their clinical practice. The program stresses the importance of early detection of fall risk through screening and assessment, along with suggested interventions to help decrease identified risk factors. The STEADI program also provides information on screening questions, assessment techniques, and falls data specifically for patients (CDC, 2020c). A successful fall risk management protocol implemented by the health care provider should be a two-part process. One part requires a fall risk assessment, the next part includes a discussion of recommended interventions with the patient (Franklin & Hunter, 2020).

Compliance with quality initiatives such as HEDIS measures can contribute to fall prevention. Primary care providers and health care organizations need to ensure adherence to practice guidelines, and the practice of fall risk management to ensure quality care is provided. One of the barriers to providing quality fall risk management is a lack of knowledge by the primary care providers. A survey of primary care providers in Massachusetts identified that only 52% of the providers felt comfortable with assessing their patients for fall risk, and only 68% of providers identified fall risk assessment as standard practice (Howland et al., 2018).

Problem Identification

A primary care clinic in Southern Nevada has identified that improvement is needed in the HEDIS measure of fall risk management. Compliance with HEDIS measures ensures monetary compensation in the form of reimbursement from CMS. Since there is no protocol for fall risk management currently in practice at the project site, CMS reimbursement is not provided

at its optimal rate. Appropriate fall risk management will lead to proper reimbursement, higher quality ratings, lower costs to health organizations through the avoidance of emergency department visits and hospitalizations, and ultimately improved health outcomes for the patient.

Project Question

Will the implementation of a falls risk management protocol in a primary care clinic improve knowledge and performance of fall risk management by providers in a four to five-week implementation period?

Population:	Primary care clinic providers
Intervention:	Institute a fall risk management protocol
Comparison:	No fall risk management protocol
Outcome:	Improve provider performance of fall risk management
Timeline:	Four weeks to implement the protocol and one week to tabulate results and analyze data

Search Methods

A review of the literature regarding falls prevention was conducted using the library databases CINAHL, PubMed, and ProQuest. The search was limited to articles in the English language, peer-reviewed, and published within the last five years. Keywords used for the search included “fall prevention”, “fall risk management”, “primary care”, and “elderly”. The initial search retrieved 159 articles. The titles were reviewed, and the articles were further narrowed to focus on the geriatric population in the primary care outpatient setting. The literature review was limited to studies that were performed in the United States (U.S.), with some exceptions of relevant studies conducted in other countries that focused on the management of falls from a primary care perspective. Articles that directed studies on falls related to specific diseases were

excluded to allow for a review of fall management in the general elderly patient population. The abstracts of the remaining 43 articles were reviewed, four articles were excluded as duplicates, and the most relevant articles were kept from exclusion based on relevance to the project question. Seventeen articles were identified as appropriate and provided significant information for the literature review.

Review of Literature

The literature review was conducted to identify current findings and practices related to falls and fall prevention in the elderly patient population. The review of the literature provided information on the impact that falls have on the health of the elderly as well as the economic impact that falls have on the health care system. The need for fall risk management is established in the literature. The CDC has developed a fall risk management program called STEADI to assist health care providers with fall risk management. Several health organizations have implemented STEADI and other fall risk management programs, and the literature shows that there are barriers in both patient and provider perceptions that must be overcome to implement a successful fall prevention program.

Review of Study Methods

Upon reviewing the study methodologies, the emerging themes are relevant for the completion of this DNP project. The literature reviewed on the topic of falls and fall prevention in the elderly population included mixed-method studies, meta-analysis of randomized control trials, qualitative studies, systematic reviews of peer-reviewed articles, retrospective studies, interventional trials, cluster randomized trials, and a prospective cohort study. These methods are relevant to this DNP project because they are reliable and valid since the studies produce similar results with the identification of risk factors contributing to falls, recommended interventions to

prevent falls, provider perceptions on fall risk management, and patient perceptions regarding falls.

Impact of Falls and Need for Fall Risk Management

Falls are a leading contributor of morbidity and mortality in the elderly. According to Bhasin et al. (2018), there are approximately 424,000 deaths annually worldwide as a result of falls. One in three elderly Americans experiences a fall annually, with 30% suffering moderate to severe injuries. Hospitalizations for fall injuries are often related to head and hip injuries (Choi et al., 2019). Even patients that have fallen but not suffered an injury report limiting their daily activities due to a fear of falling (Bhasin et al., 2018).

A research study by Choi et al. (2019) reviewed data from the U.S. National Health Interview Survey that included 1,840 respondents who were older than 60 years of age and had suffered an injury from a fall. The purpose of the study was to identify health problems and other socioeconomic factors that contribute to falls and hospitalization. The findings of the study show that fall injuries result in costly care, and specific strategies can assist with fall prevention. One of the recommendations by the researchers is to improve access to fall prevention programs for the elderly that live alone and experience balance problems since they may have limited access to community-based fall prevention programs. Another recommendation from the study is to educate patients and family members on behavioral modification to improve mobility and balance since most falls occur at home as a result of tripping or a loss of balance. The study also found that the inclusion of an occupational therapist to identify home modifications had the greatest potential of helping the elderly prevent falls at home (Choi et al., 2019).

A research study by Ward et al. (2019) was performed to investigate the relationship of neuromuscular and clinical factors with fall risk. The study included 365 elderly primary care

patients with neuromuscular impairment and a history of falls. Neuromuscular factors reviewed included strength, range of motion, and endurance. Clinical factors identified included cognitive impairment, depression, and pain. The study concluded that neuromuscular and clinical factors are related and must be considered together when designing fall prevention programs. The study further established that neuromuscular impairments resulted in decreased mobility in the elderly, but found that a high level of musculoskeletal pain in addition to neuromuscular impairments lead to a fall rate that was five times higher than with neuromuscular impairments alone. The researchers hypothesized that patients experiencing musculoskeletal pain rely on their neuromuscular abilities to help them from falling, and the neuromuscular impairment hampered that ability. The research found no relationship between low levels of pain and neuromuscular impairment leading to an increase in fall risk (Ward et al., 2019).

As mentioned previously, the costs related to falls is high with Medicare being responsible for paying more than have of the national costs (Florence et al., 2018). Health care organizations are increasing spending to treat patients after falls, and organizational reimbursement from Medicare is being affected negatively due to a low performance rating on fall risk management (Cuenca, 2017). The cost for caring for elderly patients with fall-related injuries is predicted to rise from 35 billion dollars annually in 2012 to 100 billion dollars by 2030 (Urban et al., 2020).

Current Recommendations on Implementing a Fall Risk Management Program

Stevens et al. (2017b) stated that the Cochrane Collaboration performed a meta-analysis of randomized controlled trials and found that assessing fall risk in the elderly and treating symptoms of chronic health problems can decrease fall risk. A systematic review by the USPSTF concluded that primary care providers that suggested interventions such as exercise and therapy

helped to decrease fall risk in the elderly (Stevens et al., 2017b). These findings are congruent with a systematic review and network meta-analysis by Cheng et al. (2018) where they found that suggested interventions by providers along with assessment can help decrease the incidence of falls in the elderly. Cheng et al. further compared various fall prevention interventions to assess for effectiveness, and identified the following interventions as most effective: multifactorial interventions, education and exercise, and exercise and hazard assessment with modification (Cheng et al., 2018).

According to Siegrist et al. (2016), a falls prevention program in the primary care setting is effective in decreasing the incidence of falls and fall-related injuries in elderly patients identified as fall risk. Siegrist et al. (2016) performed a cluster randomized study on 378 elderly patients at 33 different primary care clinics where 222 participants took part in a fall prevention program that included education, exercise, and gait training, and the remaining 156 participants received the usual care of no structured program other than the primary care provider's own knowledge and experience with falls. Over a one-year period, there were instances of falls in both groups, but there was a lower incidence rate of falls and injuries in the intervention group. Along with the lower rate of falls, the intervention group also had an improved performance in the Timed-Up-and-Go-Test (TUG), and the patients in this group had a lesser fear of falling (Siegrist et al., 2016).

The STEADI initiative was developed by the CDC to help health care providers improve the management of fall risk. A retrospective study by Stevens et al. (2017b) describes the results of the implementation of the STEADI program in a large group medical practice that includes 29 primary care centers. The STEADI program was launched in the organization in 2012, and a review was conducted after three years. The research by Steven et al. discovered that 80% of

elderly patients were screened for fall risk in the first year, however this number decreased to 50% by the second year of implementation. After refresher training sessions were performed, the screening rates improved by the third year. The study also found that providers were receptive to the program, but had concerns of practicality due to time constraints with patient visits and the various other health issues that needed to be addressed (Stevens et al., 2017b).

Other issues that arose during implementation of the STEADI program dealt with appropriate fall risk assessments, tracking, reporting, and inconsistent follow-up after fall risk identification. The researchers concluded that a fall risk management program can be successfully implemented in the primary care setting, but the program must be adapted, and training customized for each clinic. Additionally, regular training and case management involvement is necessary to promote patient compliance to the program (Stevens et al., 2017b).

The study by Stevens et al. (2017b) reviewed the ability to successfully implement a fall risk management program, and a separate cohort study by Johnston et al. (2019) evaluated the outcomes of implementing the STEADI program in the same primary care settings. In the study by Johnson et al., the use of hospital services both before and after implementation of the STEADI program was reviewed for a sample size of 12,346 elderly patients that were screened for fall risk in the primary care clinics. The patients were classified into three separate groups: 1) at-risk with no plan of care, 2) at-risk with a multifactorial plan of care, and 3) not at-risk. The study showed that in the three-year period reviewed after implementation of the STEADI program, 90% of elderly patients were screened for fall risk and 18% were identified as at-risk. The study also found that patients identified as at-risk and received multifactorial interventions were 40% less likely to receive hospital services as a result of a fall. The study by Johnson et al. (2019) demonstrates that the implementation of the STEADI program in the primary care setting

decreases the fall related hospitalizations. The study also concluded that screening for fall risk is not effective without a multifactorial plan of care that includes strategies for reducing risk factors for falls (Johnson et al., 2019).

A prospective, mixed-methods study was performed by Urban et al. (2020) to identify the effect of STEADI educational materials on the knowledge and implementation of the STEADI initiative in the primary care setting. The study was performed on 29 providers and medical assistants, and found that even though there was a significant increase in awareness between pre-education and post-education on the STEADI initiative, there was no significant increase in the providers' intent to use STEADI. The researchers concluded that educating providers alone may not be enough to effect long-term change. Sustainability will require a pre-implementation assessment. The use of a pre-implementation assessment can help providers identify their needs prior to carrying out a new fall management program, and can help program designers identify barriers and facilitators to program implementation (Urban et al., 2020).

According to Eckstrom et al. (2016), a collaborative approach to fall risk management and interprofessional training is effective in increasing the use of fall prevention interventions. The quantitative and qualitative study by Eckstrom et al. described the results of a project that involved an interdisciplinary team teaching approach in assisting health care providers with fall risk management in elderly patients. The interdisciplinary teaching team included representatives from medicine, nursing, pharmacy, and social work. The teaching team provided education on fall risk management to 25 separate clinical sites, and conducted follow-up every one to three months for a 12-month period. Patient charts were randomly selected and reviewed pre- and post-education. The clinical sites showed improvement in implementing falls preventions strategies such as assessments, referrals, and medication changes. The study by Eckstrom et al.

demonstrates that an interdisciplinary team approach with education is effective in changing fall risk management behavior by health care providers (Eckstrom et al., 2016).

Perceptions of Health Care Providers

Analysis of a study on the fall prevention approaches of primary care providers conducted by Burns et al. (2018) demonstrates that fall prevention interventions suggested by the primary care provider can vary based on the type of provider. The 1210 primary care providers that participated were either family practitioners, internists, or nurse practitioners. Of the participating providers, 89% state that they discuss fall prevention interventions with their elderly patients; however, fall prevention discussion is higher with family practitioners and nurse practitioners than with internists. The most common fall prevention suggestion presented by primary care providers is home modification, and one of the least suggested interventions is the use of Tai Chi, despite it helping with balance and reducing falls. Nurse practitioners are less likely to suggest vitamin D supplementation or adjust medications as compared to family practitioners and internists. The study did suggest that differences in prescribing privileges from state to state may play a role in the nurse practitioner's fall prevention interventions (Burns et al., 2018).

There is a discrepancy in health providers' perception of fall prevention interventions and the implementation of recommended practice guidelines. A systematic review of literature by Lau et al. (2016) was conducted to investigate the causes of this practice gap in the use of evidence-based interventions in current practice. Lau et al. identified 21 primary themes and 40 secondary themes that were classified into the four levels of their developed conceptual framework of barriers and facilitators to implementation. The four levels of the framework are external context, organization, professional, and intervention (Lau et al., 2016).

When implementing new interventions into practice, understanding these four levels and

how the proposed intervention fits within the four levels will be important for successful implementation. The first level of external context encourages a review of how the proposed intervention fits with current policies and the organization's objectives. The level of external context also stresses communication with key stakeholders about the benefits of the proposed intervention. The second level of organization encourages one to consider how the proposed intervention will affect current workflow, determine the resources necessary, devise a strategic plan with measurable goals, and engage key staff to promote and coordinate implementation. The third level of professional emphasizes consideration of how health care professionals may view the proposed intervention as it relates to their current role, and how different tasks are currently carried out in clinical practice. The fourth level of the conceptual framework states that the proposed intervention should integrate with current systems and workflow, should deliver desired outcomes, and should protect patient safety and privacy (Lau et al., 2016).

A study by Howland et al. (2018) was conducted to identify fall prevention practices by primary care providers with the hope of understanding why fall prevention programs have not been integrated into clinical practice. Ninety-seven primary care providers participated in the study which included physicians, physician assistants, and nurse practitioners. Ninety-six percent of the providers agreed that all elderly patients should be assessed for fall risk, but only 68% of the providers believe that fellow practitioners are assessing their elderly patients for fall risk, and only 52% feel that they are competent with conducting a fall risk assessment (Howland et al., 2018). When it comes to awareness of fall prevention programs, only 43% of providers are familiar with Tai Chi, and only 14% are aware of the CDC's STEADI initiative. Of the providers that are aware STEADI, only half are using it in their practice (Howland et al., 2018).

According to the study by Howland et al. (2018), fall risk management programs are not

routinely integrated into clinical practice. The study recommends that strategies should be made to directly target primary care providers and provide them with education on fall risk management. Another recommendation by the study is for health care organization to offer fall prevention educational programs for their patients to help decrease health care costs associated with fall-related injuries (Howland et al., 2018).

Risks for Falls and Perceptions of Patients

According to the CDC (2020b), one of the predictors of falls is a history of previous falls. The reporting of a fall by the patient to their health care provider can prompt the provider to identify the patient as fall risk and initiate fall prevention interventions. However, some patients may not report falls to their provider, thus falling through the cracks. A study by Hoffman et al. (2018) was performed to assess the factors affecting the accuracy of self-reported fall injuries. A fall risk questionnaire is currently a component of the Medicare Annual Wellness Visit to help identify patients with fall risk and prevent falls. Hoffman et al. reviewed data from Health and Retirement Study and fall-related injury reports from Medicare where 47,215 patients were included in the study. The study found that only 28% of Medicare patients that were treated for a fall-related injury reported a fall injury when questioned (Hoffman et al., 2018).

The study by Hoffman et al. (2018) identified that patients aged 65-74 denied receiving medical care for a fall because they see themselves as healthy and not at-risk. The study also found that patients who suffered minor injuries from a fall underreported their falls. Hoffman et al. hypothesized that a medical evaluation that did not include a procedure was not perceived by these patients as medical treatment. The study further theorized that falling may be a stigma to patients and will show weakness, so patients may be embarrassed or afraid to admit falling. Some patients that fell also attributed their fall injury to environmental hazards as opposed to their

health or behavior. Hoffman et al. suggests rewording questionnaires assessing a history of falls to include questions about seeking medical attention and not just medical treatment, and asking about falling even if the cause was accidental or due to tripping. Further suggestions include defining falls on surveys and reporting minor injuries (Hoffman et al., 2018).

A study by Qin & Baccaglini (2016) examined the determinants of falls in the elderly. The study was performed through a review of the California Health Interview Survey and included 527,340 elderly that had multiple falls in the previous 12-month period. The study identified that individuals that walked less than 10 minutes per week had double the odds of falling as compared to individuals that walked at least 30 minutes a week. Falls were more common in elderly with a history of stroke, heart disease, hypertension, or diabetes. Other factors that showed a greater prevalence of falls were being female, single, and obese. The study did not identify any correlation between poverty level, educational level, or smoking and alcohol use as leading to a greater incidence of falls. Qin & Baccaglini (2016) discovered that 45% of individuals that had reported falling stated that they did not receive instruction from their health care provider on how to prevent future falls after follow-up, and 70% of individuals that had a history of a fall but saw their provider for a different reason were never instructed on how to prevent falls (Qin & Baccaglini, 2016).

Individuals that had experienced a previous fall reported making changes to prevent future falls. Some of the changes included using an assistive device, exercise, medication changes, and making home modifications. However, 60% of the individuals who made these changes did so independently without provider recommendations. The study concludes that fall management programs must identify high-risk groups and modifiable risk factors. Patients will make changes, and may do so without provider input, and so fall management programs must

include education to prevent future falls, but that primary care providers need to play a more prominent role in fall prevention (Qin & Baccaglini, 2016).

Identifying risk factors for falls is important to recognize when developing a fall risk management program. Much research has been focused on identifying fall risk factors and developing interventions to control the risk factors; however, the patient must be willing to participate in a program and implement fall prevention activities. Stevens et al. (2017a) conducted an analytic review of several studies that examined the beliefs and attitudes of elderly patients in adopting fall prevention behaviors. The review by Stevens et al. (2017a) mentions that many older adults view falling as a normal part of aging, and that falls are a sign of physical decline. If an older adult experienced a fall, they would often attribute the fall to external factors such as uneven flooring, or dismiss it to other temporary conditions such as dizziness. In the previous research reviewed by Stevens et al., the main fall prevention techniques that many elderly individuals had was to move slowly, carefully, and limit activity, which in turn can result in loss of muscle strength and increase risk of falls (Stevens et al., 2017a).

The review of the research studies goes on to state that most elderly patients are not aware that exercise is beneficial for improving balance and muscle strength, and those that were aware of the benefits did not partake in exercise activities because it meant admitting that they were a fall risk and can be viewed as weak. If the individual viewed themselves as fit and healthy, they saw no benefit in exercise programs to prevent falls. Elderly individuals want to maintain their independence, and so they avoid discussions about falls with their family and health care provider to avoid being viewed as frail or disabled. According to the review, some individuals did not view falls as a medical problem and did not want to discuss them with their provider (Stevens et al, 2017a).

Elderly patients in the research studies reviewed by Stevens et al. (2017a) stated they respect and listen to their health care providers, but felt discouraged from discussing fall prevention with their provider if the provider appeared dismissive of the patient's fall risk or if the provider was not informed about fall risk prevention. Additionally, patients stated they would follow their provider's recommendations for decreasing fall risk, but would fail to do so if the information was not specific and if there were no referral or follow-up by the provider (Stevens et al., 2017a).

Research studies reviewed by Stevens et al. (2017a) found that fall prevention program participation and adherence was improved when patients understood the benefits of the interventions and had support and encouragement from health care professionals.

According to Stevens et al. (2017a), the patient's health care provider must make the patient recognize their fall risk and stress the benefits of fall prevention activities. The provider plays a key role in education, encouragement, and reinforcement for their elderly patients' participation and adherence to fall prevention programs. The review mentions the CDC's STEADI initiative is a tool that providers can use to open the dialogue with elderly patients regarding fall risk management (Stevens et al., 2017a).

A separate review of previous research to identify barriers and facilitators to participation in fall prevention interventions by elderly patients was performed by Tzeng et al. (2020). The review by Tzeng et al. involved 17 peer-reviewed journal articles that were published between 2009-2019. The findings of the review identified three major categories of barriers: 1) capability-related barriers, 2) motivation-related barriers, and 3) opportunity-related barriers. Capability-related barriers include language, literacy level, and overall health status. Motivation-related barriers include lack of motivation, and denial of fall risk. Opportunity-related barriers include

lack of institutional support, lack of social support, and lack of access to intervention (Tzeng et al., 2020). The most common capability-related barrier noted in the research is general physical health and the ability to participate in fall prevention interventions. The most common motivation-related barrier is a lack of motivation, and the most common opportunity-related barrier identified in the research studies is a lack of institutional support. Several of the studies reviewed mentioned that the lack of institutional support included a lack of interest by health care staff in promoting fall prevention interventions, and a lack of understanding about fall prevention programs (Tzeng et al., 2020).

The review by Tzeng et al. (2020) also identified facilitators to participation in fall prevention interventions. The facilitators were also broken down into the same major categories as the identified barriers. The most commonly identified capability-related facilitator is the use of language and communication aids such as interpreters and audio-visual material. For the most commonly identified motivation-related facilitator the researchers determined that providing education to change the perception of falls and fall risk was most beneficial. The researchers also identified that institutional support of fall prevention programs was the most commonly identified opportunity-related facilitator (Tzeng et al., 2020).

Issues Still Under Investigation

As mentioned in the review of literature, most of the research performed on falls and fall prevention have focused on identifying fall risk factors and identifying interventions that can help control the risk factors. Despite the identification of fall risk factors, research shows that both patients and health care providers still have barriers to overcome to be able to fully integrate a fall risk management program for elderly patients into routine practice. The inclusion of fall assessments into Medicare annual wellness visits, the inclusion of fall risk management as a

HEDIS measure, and the development of national programs such as the CDC's STEADI initiative are all a good start for an organization to focus on the development of a fall risk management program. The effectiveness of the program will depend upon taking into account all of the perceived barriers and facilitators.

Project Aims

The overarching aim for this DNP project is to reduce the incidence of falls in the elderly population and to improve HEDIS scores for fall risk management in the primary care clinic.

Project Objectives

The objectives of the DNP project that will be met in the timeframe of the program:

1. Develop a fall risk management protocol to be used by primary care providers.
2. Create an educational program to increase provider knowledge and awareness regarding fall risk management.
3. Evaluate change in provider knowledge and awareness regarding fall risk management by administering a pre- and post-educational test.
4. Evaluate for provider compliance with the fall risk management protocol through chart audit.

The timeline for these objectives to be met is a five-week implementation period.

Theoretical Framework

The conceptual framework that will be used for this DNP project will be Dr. W. Edwards Deming's Plan-Do-Study-Act (PDSA) model, also know as the Deming Cycle (Appendix A). The PDSA model of Deming was first utilized by engineers and business industry executives, but has since been adopted by health care programs (Hall & Roussel, 2017). Quality improvement programs are used in all industries to ensure the delivery of a quality product, and the business of

health care is no different. The principles of quality improvement include the assessment and improvement of work processes to deliver customer satisfaction (Cherry & Jacob, 2017). The use of protocols and standards in an organization outline expectations and accepted practice (Marquis & Huston, 2015). The development and implementation of the proposed protocol is expected to provide the primary care clinic with the expectations for fall risk management. The PDSA model will be used to evaluate the effectiveness and sustainability of the project.

Historical Development of the Theory

W. Edwards Deming was born in Sioux City, Iowa in 1900. He earned a B.S. in engineering in 1921 from the University of Wyoming, an M.S. in mathematics in 1925 from the University of Colorado, and a Ph.D. in physics in 1928 from Yale University. His career started in the Laboratory of the Ministry for Agriculture, followed by work with the U.S. Census Bureau in 1939 where Dr. Deming implemented the first census to be performed by sampling (Dodge, 2008).

In 1950, Dr. Deming was invited to Japan to provide a lecture on quality control. Dr. Deming publicized the quality improvement model known as PDSA, and his lectures inspired Japanese businesses to adopt his teachings and helped Japanese automobile makers dominate the industry for years (Balakrishnan, 2015). The PDSA model provides for a quality improvement initiative to be tested in a smaller scale prior to being adopted and rolled out into widespread use. Another aspect of Dr. Deming's theory is the importance of individual development leading to organizational improvement. Individuals need to develop an understanding of events and relationships, and this new knowledge will improve judgment and be used to teach others and help change current beliefs and practices towards improvement and transformation of the organization (Balakrishnan, 2015).

Dr. Deming's model evolved from the business and auto industries and has been adopted by the health care industry. The model provides a structure to develop changes, test the changes, and then fully implement the changes for improvement. This structured approach prevents making wholesale changes without first testing the change, and allows the stakeholders of the organization to assess if the proposed change will succeed (Williams & Caley, 2020).

Major Tenets of the Theory

Plan

The principle of the Plan phase in the PDSA model is where the proposed process improvement is designed and will include information to clearly identify what is to be implemented, where is the implementation going to take place, when is the implementation going to take place, and who will be involved with the implementation (Williams & Caley, 2020). The Plan phase will help the project lead identify the change that is to be tested or implemented, and also determine the design strategy (Daaleman & Helton, 2018). It is also during this phase when objectives are defined and methods for evaluation are developed (Balakrishnan, 2015).

Do

It is during the Do phase of the PDSA model where the interventions of the proposed process improvement will be carried out (Balakrishnan, 2015). A project team should be assigned to assist with implementing the proposed change, and the team should include an internal content expert. It is during this execution phase where the project team will communicate the benefits for the organization to the project participants. Information on the implementation of interventions and the achievement of program outcomes will frequently be gathered during the Do phase in order to later provide adequate feedback to the organization's stakeholders. It is the project's program outcomes that were developed in the Plan phase that will guide the monitoring of the

interventions and also identify issues that may arise during the Do phase in a timely manner so that corrections can be made (Van Bogaert & Clarke, 2018).

Study

After the interventions are implemented, the Study phase is where the data is analyzed, and evaluations are made on the achievement of the process improvement outcomes (Balakrishnan, 2015). The evaluation of the developed outcomes will be based on data collected both before and after the implementation of interventions to study the impact of the change (Williams & Caley, 2020). Analysis will be conducted to assess why the project did or did not work, and the lessons learned from the experiment will be evaluated (Daaleman & Helton, 2018).

Act

During the final phase of the PDSA model, the results of the study will determine the action that will be taken next. The organization stakeholders will make a decision based on the information collected during the first three phases of PDSA. The decision may be to adopt the change if the process improvement resulted in favorable outcomes, refine the plan and repeat the PDSA phases, or reject the proposed improvement initiative (Balakrishnan, 2015). The success or failure of the proposed process improvement can be used to make decisions on future initiatives, thus leading to an ongoing increase in knowledge and organizational development (Daaleman & Helton, 2018). Van Bogaert & Clarke (2018) state that in order for an initiative to be considered a success, the results must demonstrate improvement and also sustainability.

Application of Theory to Health Care Practice

The PDSA model can be used in health care practice at the individual patient level to provide care, or to affect system-wide organizational change (Daaleman & Helton, 2018). An example of the application of the PDSA model being used at the individual patient level is

provided by Balakrishnan (2015) for a patient being treated for granulomatosis. The patient was initially treated with a medical intervention developed through the use of the PDSA model. During the Act phase, the intervention was only partially effective based on the defined outcomes. After further review, the cause for a lack of full effectiveness was identified and a new PDSA cycle was initiated which resulted in successfully meeting the defined outcomes (Balakrishnan, 2015).

Examples of the PDSA model being used at the systems level are provided by Van Bogaert & Clarke (2018). Two hospital-wide goals were falling short of expectations, and the two areas that needed improvement were falls and central line associated bloodstream infections (CLABSI). The PDSA model was used to address both areas. Project teams were developed to address falls and CLABSI, the four phases of PDSA were implemented, and at the end of the cycles a decrease in the rate of falls and a decrease in the rate of CLABSI were identified. The interventions used to address the two issues were included into hospital practice, and improvement rates have been sustained (Van Bogaert & Clarke, 2018).

Application of the Theory to the DNP Project

This DNP project is being developed to establish if the implementation of a fall risk management protocol in a primary care clinic will improve provider performance of fall risk management for elderly patients. Dr. Deming's PDSA model will help guide the project because a thorough plan for the protocol, including SMART outcomes will be developed. The improvement initiative will then be implemented, the results analyzed, and success or failure of meeting expected outcomes will be evaluated to identify sustainability of the project.

Plan

During the Plan phase, the subject of fall risk management in the primary care setting was

identified by the organization. Investigation of fall risk management in the primary care clinic will include observation and discussion with providers and clinic staff to assess current knowledge and practices used for fall risk management. Current practice standards will be investigated and compared with the results of the clinic assessment. In the Plan phase, the DNP student will: develop outcomes, develop an educational program to increase knowledge of fall risk management, develop an assessment tool to evaluate provider awareness of current fall risk management interventions pre and post education, develop the fall risk management protocol based on current practice standards, and develop a plan for evaluating the meeting of expected project outcomes.

Do

The DNP project will be implemented over a four-week period at one of the identified primary care clinics. At the beginning of the four-week period, a pre-test will be administered to the providers to assess baseline awareness of current fall risk management standards. Education will be provided to the providers, and then a post-test will be administered to assess for an increase in awareness of fall risk management. After the educational segment, the fall risk management protocol will be implemented at the clinic. During the implementation phase, the DNP student will monitor the clinic and assess for compliance with the fall risk management protocol. Data will be collected to identify progress towards meeting project outcomes.

Study

Analysis of the pre and post-test results will identify if awareness of current practice standards as it relates to fall risk management was improved after the educational program. Review of patient charts before and after implementation of the fall risk management protocol will identify an improvement in fall risk management by providers. Assessment of the success of

the DNP project will be demonstrated by the results of the educational program and performance on fall risk management.

Act

The data collected during the Study phase of the project will be the supportive evidence used when presenting the outcome of the DNP project to the organizational stakeholders. The data presented will aid in the decision by the organization to either adopt the fall risk management protocol and implement the program in other primary care clinics within the organization, reject the protocol, or identify required revisions to the protocol. The PDSA model is an appropriate conceptual framework to use for this quality improvement project as it has been proven effective in both the business and health industries, and the PDSA cycle will assist the stakeholders of the organization to make an informed decision in the applicability of the proposed fall risk management protocol.

Setting

The project setting is a primary care clinic located in the metropolitan Las Vegas area. The clinic that will be utilized as the project site is part of a 35-clinic medical group in the Las Vegas area that has been in operation since 2007. In 2019, the primary care clinic and the other clinics in the medical group were purchased by an organization based out of Utah. The patient population for this clinic are individuals 65 and older. The clinic provides care to more than 700 patients per month. The services offered at the clinic are those typically provided at primary care clinics such as chronic care management, patient education, annual wellness visits, and medication management. Electronic health records are utilized at the primary care clinic through TouchWorks EHR.

Population of Interest

The direct population of interest for the DNP project consists of providers and staff employed at the primary care clinic. The staff at the primary care clinic consists of three physicians, one nurse practitioner, one physician assistant, six medical assistants, and a practice manager. The inclusion criteria comprise all staff that that are employed at the primary care clinic and provide direct patient care, such as physicians, nurse practitioners, physician assistants, medical assistants, and front office staff. Clinic staff that do not provide direct patient care and any medical students that are rotating through the primary care clinic during the time of project implementation are excluded from participation. The indirect population of interest for the DNP project consists of patients over the age of 65.

Stakeholders

The stakeholders for this project include the health care organization administration and Medical Director for the primary care clinics in the Las Vegas area who have identified falls as a problem with elderly primary care patients, the clinic practice manager, the providers, and clinic staff who will all take part in implementing the falls management protocol. The indirect population of interest, the patients at the primary care clinic, are also stakeholders since they will be affected by the outcome of the project. An affiliation agreement is current between the project site and the University, and permission to complete the project has been granted by the Medical Director and the organization (Appendix B).

Interventions

The timeframe to complete the project is five weeks. During week one of the project, the primary care clinic staff and providers will be given a pre-test to assess their baseline knowledge as it pertains to the topic of falls management. After completion of the pre-test, an educational

session will be held by the project lead for the clinic consisting of a PowerPoint presentation and a print-out of the presentation on reducing fall risk. The presentation will be provided during lunch sessions on two separate days during week one of project implementation to ensure all clinic staff are educated on the topic of falls management. In addition to the presentation on reducing fall risk, the educational session will introduce the staff to the fall risk management protocol, which consists of the fall risk screening tool, and the fall risk management interventions. Immediately following the completion of the educational session, the participants will be given a post-test to assess understanding of fall risk management. Implementation of the fall risk management protocol at the primary care clinic will begin upon completion of staff education. During weeks two through four, the project lead will be at the clinic site daily to monitor the progress of the project, perform an audit to assess for compliance to the fall risk management protocol, and to answer any questions. Auditing of patient records will be performed at the beginning of weeks two through five to review the previous week's patient visits. The clinic staff will also be provided with the project lead's contact information for any questions that may arise when the lead is not on site. All project data will be compiled and analyzed during week five.

Tools

The various tools that will be utilized during the project will be the educational presentation, the pre- and post-test, the fall risk management protocol algorithm, the fall risk screening tool, the fall risk management interventions, and the chart audit tool.

Educational Presentation

A PowerPoint presentation (Appendix C) has been developed by the project lead and is adapted from the STEADI initiative developed by the CDC. Permission has been obtained from

the CDC to use the material found in their educational presentation (Appendix D). The educational presentation for the providers and staff at the primary care clinic will examine fall risk among the elderly population and the recommended steps that health care providers can take to prevent falls with this high risk group (CDC, 2020c). The educational presentation will be provided during lunch sessions on two separate days during week one of project implementation, and will be approximately 45 minutes. Additionally, the participants will also be provided with a handout of the PowerPoint slides.

Falls Risk Management Pre-Test/Post-Test

The falls risk management pre- and post-test (Appendix E) will be administered to the project participants before and after the educational session. The pre- and post-test are the same to assess participant knowledge before and after education. The questions used on the pre- and post-test have been adapted from the CDC's Training and Continuing Education Online site on the STEADI Initiative educational test. Permission has been obtained from the CDC to use the educational test (Appendix D). The test consists of 13 multiple-choice questions. One question is for identifying the participant's role in the clinic, and the remaining 12 questions will assess awareness of fall risk in the elderly population and the recommended steps to decrease falls in the elderly population. Multiple-choice questions have shown to be an effective way to strengthen knowledge that has been learned by providing individuals the ability to select the correct answer by re-exposing the information presented (Yang et al., 2019).

Fall Risk Screening Tool

A fall risk screening tool (Appendix F) has been developed for the assessment of the elderly patient's risk for falls. The screening tool is adapted from the CDC's STEADI Initiative fall risk assessment questionnaire. Permission has been obtained from the CDC to use the fall

risk questionnaire. Patients at the primary care clinic can either check-in via a phone app or in-person, but patients are still required to stop at the front desk to provide identification and insurance information, and so patients will be given the screening tool upon stopping at the front desk. The patients can answer the screening tool questions while in the waiting room, or in the exam room while waiting to see their provider. A score of 4-four or greater on the screening tool identifies the patient as being at an increased risk for falls. Patients that are identified as at-risk will have a Timed-Up-and-Go (TUG) test and orthostatic blood pressures assessed by the medical assistant, and the results will be documented for the provider. The medical assistant will also notify the provider if a patient is identified as at-risk which will prompt the provider to recommend interventions to manage the modifiable risk factors.

Fall Risk Management Interventions

An interventional checklist (Appendix G) has been developed by the project lead to assist providers with selecting interventions that can educate the patient in managing modifiable risk factors. The checklist will be provided in laminated form for providers and placed in each examination room. The interventions on the checklist are based on current recommended falls management interventions by the CDC. Permission has been obtained from the CDC to use the interventions for managing fall risk.

Fall Risk Management Protocol Algorithm

A fall risk management protocol algorithm (Appendix H) has been developed to guide the primary care clinic staff. The protocol algorithm was developed utilizing recommendations from the CDC's STEADI program regarding suggested tasks for primary care clinic staff, and fall risk screening approaches and assessment tools as it relates to fall prevention initiatives (Centers for Disease Control and Prevention, 2021). Not all of the fall prevention tasks have to be performed

by a primary care provider, and so tasks can be divided among the clinic staff so that no team member feels overwhelmed. Having an algorithm will allow for ease of following the protocol by assisting the clinic staff to identify each staff member's responsibilities as it pertains to the fall risk management protocol.

Chart Audit Tool

A chart audit tool (Appendix I) has been developed to review for compliance with the falls management protocol. The tool is a simple tool evaluating for performance of providers in completing the fall risk assessment and if interventions were initiated. The audit tool will identify if this protocol leads to an increased performance of fall risk management by primary care providers.

Study of Interventions/Data Collection

Data collection for the project will include the results of the pre- and post-tests administered to the clinic staff before and after the education on fall risk management, and the results of the chart audits post-education. The pre-test scores will provide a representation of baseline knowledge, and the post-test will measure the effectiveness of the educational presentation on increasing the knowledge of fall risk management and understanding the importance of performing fall risk assessment. Each question on the pre- and post-tests will be coded for data analysis. The test results will be entered into an Excel spreadsheet and analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 27. To maintain the confidentiality of the staff and providers in the pre- and post-tests, the participants will be assigned identification numbers which will be placed on the pre- and post-tests to allow for a matched analysis. All participant information will be protected with privacy and confidentiality maintained, and all data collected will be kept in the project lead's computer which is password

protected.

Data will also be collected through a chart audit of the patients seen in the clinic for the four weeks post-education to evaluate for provider compliance with the fall risk management protocol. Data collection will begin after the second week of project implementation. The data collected will identify if a fall risk assessment was performed and the fall prevention and management protocol initiated based on the risk assessment results. The data collected will be a simple yes/no format, and there will be no identifying patient information in order to maintain confidentiality of collected data from the electronic health record. All data will be entered into an Excel spreadsheet and analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 27. All information will be protected with privacy and confidentiality maintained, and all data collected will be kept in the project lead's computer which is password protected.

Ethics/Human Subjects Protection

Approval to conduct the project at the practice site was received from the practice manager and the corporate office. Since the project is a quality improvement initiative, the practice site does not require IRB approval for implementation. To ensure ethical project implementation, confidentiality, and protection of human subjects, the project lead has successfully completed all required Collaborative Institutional Training Initiative (CITI) program modules. The project is considered a clinic-wide practice change and all providers and clinic staff are mandated to participate, so no signed consent is required from the staff. Attendance in the educational presentation and participation in the project by the providers and staff is not a condition of employment, and no extra compensation or special privilege will be afforded to participants.

To maintain staff confidentiality, no identifying data will be asked or collected from the

staff. Project participants will be provided identification numbers to be used on the pre- and post-tests to allow for analysis, and only the project lead will know the identity of respondents. Each provider at the project site sees approximately 10 patients per day, and all patient charts for the patients seen in the primary care clinic during the weeks of the project implementation will be audited. The chart audits will be completed using the identification numbers assigned to the providers for the pre- and post-tests, and the chart audits will not record any identifying patient information. During project implementation, all Health Insurance Portability and Accountability Act (HIPPA) regulations will be adhered to. To further ensure for patient and participant privacy and confidentiality, all data collected will be stored in a password protected computer that is only accessible by the project lead. There are no risks associated with participation in this practice improvement project. Benefits for participants is identification if a fall risk management protocol will have a benefit of increasing awareness and compliance regarding fall risk management.

Measures/Plan for Analysis

The project question looks to assess improvement in the knowledge and performance of fall risk management. The measure of evaluating a change in provider knowledge and awareness regarding fall risk management will be performed through pre- and post-educational testing. A statistician was consulted to ensure appropriate statistical testing is utilized.

Since the same group of participants will be tested at two different occasions with a pre- and post-test design, the statistical test that will be used is a paired-samples t-test (Pallant, 2020). The participant scores will be calculated before and after exposure to the education. An increase in post-test scores will indicate evidence of improved knowledge of fall risk management after education. The outcome data of the pre- and post-tests will be analyzed using the SPSS version 27. The assumptions with this statistical test are that: the dependent variable is measured using a

continuous scale, the scores are obtained using a random sample from the population, the observations will not be influenced by any other measures, and that the difference between the two scores for each subject will be normally distributed.

Upon completion of the educational session, the expectation is that fall risk management will be performed for all elderly patients. Charts will be audited for a four-week period post-education using a yes/no format identifying for performance of fall risk assessment. Since the fall risk management protocol is new, and no comparisons can be made, a descriptive statistic of frequency distribution will be used using a 95% confidence interval to identify the fall risk assessment rate. All data collected from the chart audit will be entered into an Excel spreadsheet and analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 27 to help calculate the fall risk assessment rate. The assumptions with the statistical test to measure the performance of fall risk management are that there is a linear relationship between education and the performance of fall risk management, and that the results will not be influenced by any other measures (Pallant, 2020).

Analysis of Results

The DNP project is a quality improvement initiative with a goal of improving knowledge of providers and clinic staff as it pertains to fall risk management in the elderly population, including assessment and subsequent intervention. The overarching aim for this DNP project is to reduce the incidence of falls in the elderly and to improve HEDIS scores for fall risk management in the primary care clinic. Fall risk assessment and fall prevention intervention can be beneficial for patients and providers from both a health and financial standpoint (Franklin & Hunter, 2020).

This project sought to develop an educational presentation on falls to increase awareness

among the clinic staff and providers along with a falls management protocol that addresses assessment and related interventions for identified fall risk. The data analysis includes the knowledge of fall risk management before and after the educational presentation as well as the rate of performance of fall risk assessment and intervention taken for patients identified as at-risk for falls post-education. The data collected was analyzed using SPSS version 27. A total of eight individuals participated in the educational training in fall risk management. The participants included two physicians and six medical assistants. Participants completed a 12-question pre-test regarding fall risk management, and upon completion of the educational presentation completed a 12-question post-test.

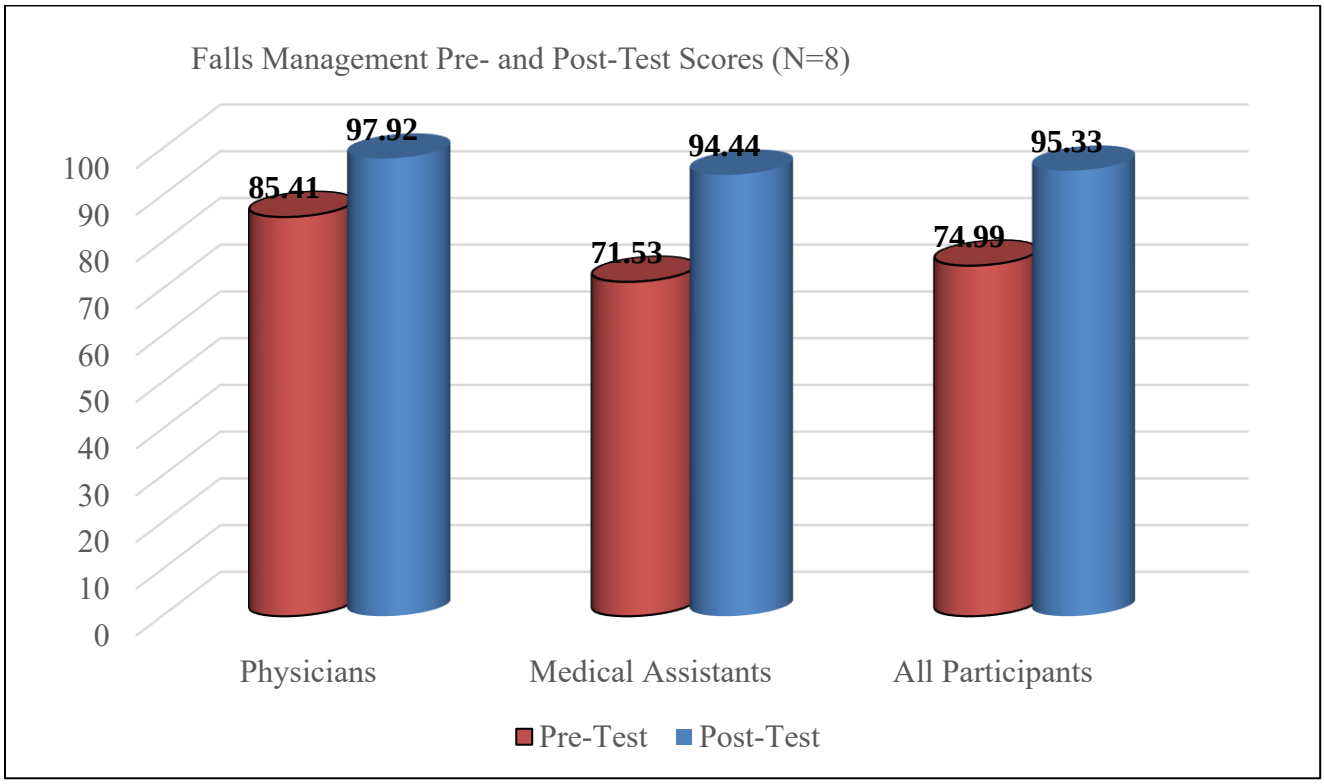
A paired-samples t-test was conducted to evaluate the influence of the of the educational presentation on the participants' scores on the Fall Risk Management Test (Table 1). The average score achieved by all eight participants before education was 74.99%. The average score increased to 95.31% after the educational presentation. Though the baseline knowledge of the medical assistants was lower than the provider baseline knowledge, post-educational scores for both groups of participants showed a significant increase. An illustration of the pre- and post-test scores between the different categories of participants can be seen in Figure 1. There was a statistically significant increase in test scores from pre-education ($M = 74.99$, $SD = 9.45$) to post-education ($M = 95.31$, $SD = 3.48$), $t(7) = 5.45$, $p = .001$ (two-tailed). The mean increase in test scores was 20.31, with a 95% confidence interval ranging from 11.49 to 29.13. The eta squared statistic (0.81) indicated a large effect size.

Table 1.

Falls Management Pre- and Post-Test Scores: Paired T-Test (N=8)

	Mean	Std. Deviation	Difference	t	p-value
Pre-Test	74.99	9.45	20.34	5.45	.001
Post-Test	95.33	3.48			

Figure 1.



To examine the impact of the educational intervention in increasing fall risk management, patient records were evaluated to identify completion of assessment of fall risk and interventions performed to address identified fall risk. Since this is a new protocol and fall risk assessments were not routinely performed as a part of patient visits, a fall risk assessment rate of 0% will be used as baseline. During the four weeks of project implementation, a total of 254 patients were seen by the providers that participated in the project (Table 2). The review of patient records showed that of the patients seen by the participating providers during the implementation period (n =254), all of the patients were assessed for fall risk demonstrating a 100% assessment rate. The fall risk assessment rate increased 100% upon implementation of the fall risk management protocol and stayed at a 100% completion rate for the entire project implementation (Figure 2). Of the patients assessed in the four-week implementation period (n = 254), 52.8% of the patients seen were identified as an increased risk for falls (n = 134); and of the patients identified as increased fall risk, the fall risk was addressed with interventions 94% of the time (Figure 3).

Table 2.

Falls Assessment, Identification, and Intervention Among Elderly Patients Treated in Primary Care

	Week 1	%	Week 2	%	Week 3	%	Week 4	%	Total	%
Patients Seen	63		73		48		70		254	
Assessed for Fall Risk	63	100%	73	100%	48	100%	70	100%	254	100%
Identified as Increased Fall Risk	30	47.6%	37	50.7%	26	54.2%	41	58.6%	134	52.8%
Intervention for Fall Risk	28	93.3%	37	100%	22	84.6%	39	95.1%	126	94%

Figure 2.

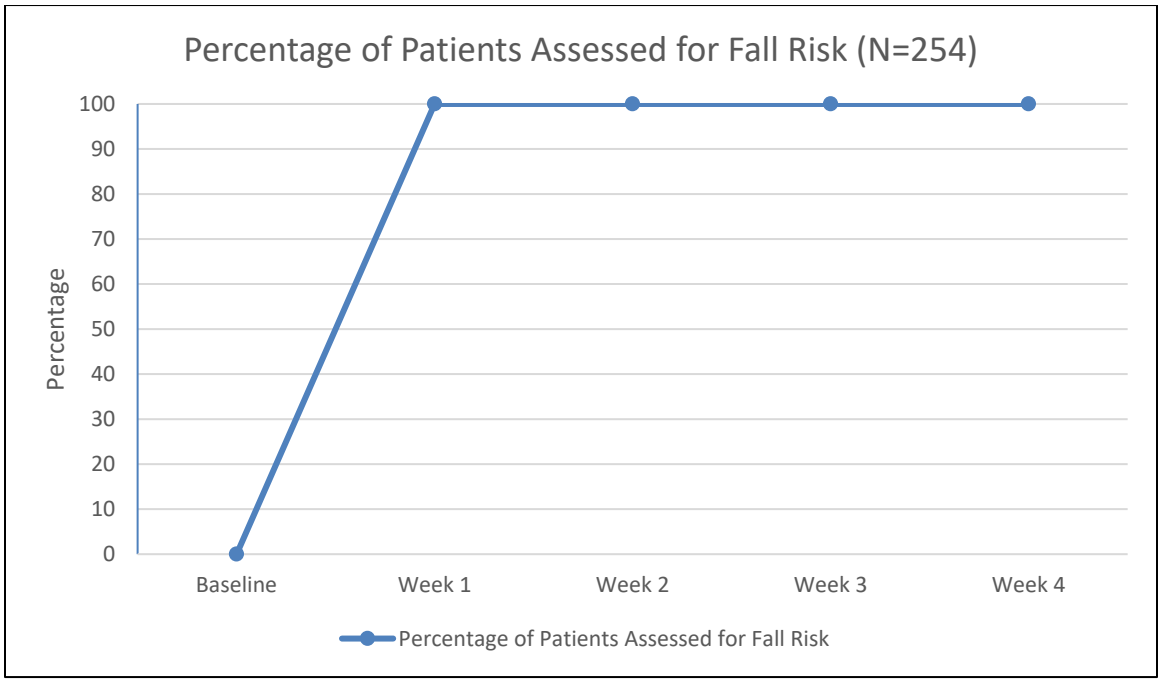
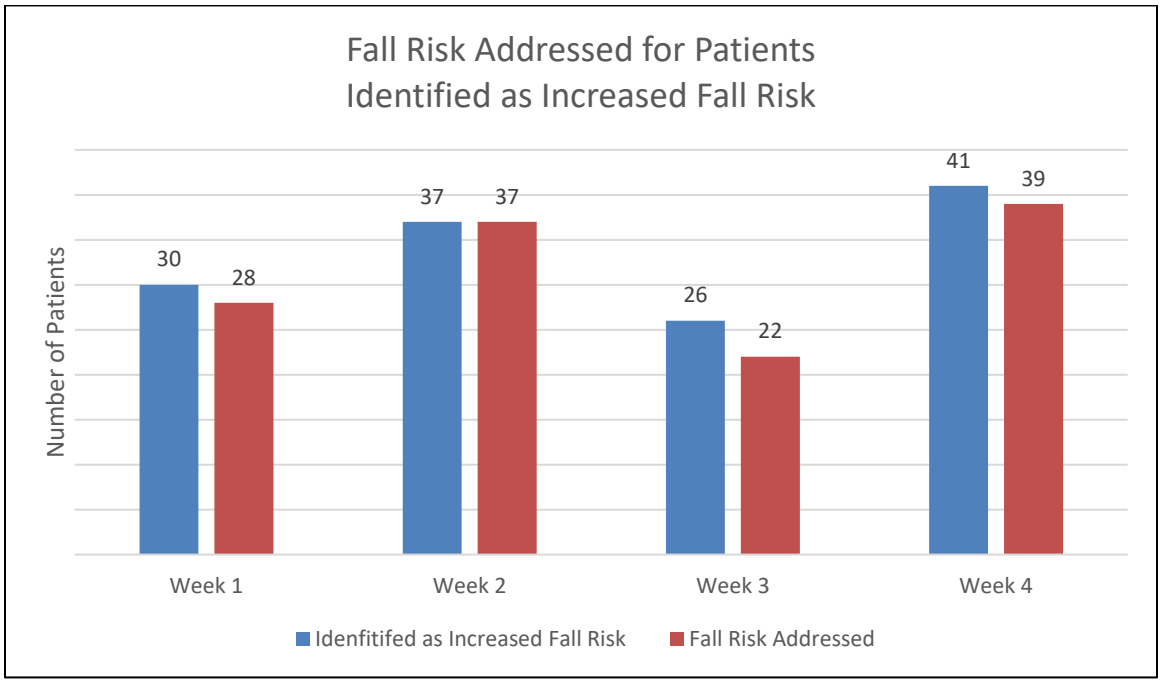


Figure 3.



The project sought to identify if implementation of a falls risk management protocol in a primary care clinic will improve knowledge and performance of fall risk management by providers. The analysis results indicate there has been a significant increase in knowledge and performance of fall risk management. The findings suggest that education and having a protocol in place will lead to increased fall risk assessment from the patient's primary care provider.

Discussion of Findings

Prior to the implementation of the project, fall risk assessments were not routinely performed as a part of regular patient visits at the project site. This aspect of fall risk assessment not being performed during patient visits is echoed in other studies that have found that primary care practices characteristically have a low incorporation of fall prevention strategies with patients (Sarmiento & Lee, 2017).

The objectives of the DNP project were to: develop a fall risk management protocol, create an educational program to increase knowledge and awareness regarding fall risk management, evaluate change in knowledge and awareness regarding fall risk management through a pre- and post-educational test, and evaluate for provider compliance with the fall risk management protocol. The PICOT question that helped guide the development of this quality improvement project was whether the implementation of a falls risk management protocol would improve knowledge and performance of fall risk management in a primary care clinic.

The results of the data analysis indicate that after four weeks of implementation, the quality improvement project was successful at meeting the expected outcomes. The knowledge of the clinic staff and providers increased from 75% before the educational intervention to 95.3% after education. The 20.3% increase in knowledge indicates that the education was highly successful with significantly increasing knowledge on fall risk management for all participants

(t=5.45, p=.001). The data shows that medical assistants experienced greater knowledge gains than physicians, 22.9% versus 12.5%, which may be attributed to increased baseline knowledge by providers regarding medical conditions and modifiable risk factors leading to increased fall risk. However, medical assistants scored better on the pre-test with questions pertaining to the performance of specific fall risk assessment tests such as the TUG test.

After educating the clinic staff and implementing the fall risk management protocol there was a 100% compliance rate in the performance of fall risk assessments, and the compliance stayed at 100% for the entire four-week period of project implementation. This finding is significant as it suggests that education and awareness are key factors in the performance of fall risk management. Previous studies have shown that <60% of physicians regularly screen for fall risk in elderly patients or even have discussions regarding fall risk factors (Burns et al., 2018). Some providers have attributed the decreased performance of fall risk management to a lack of confidence in performing fall risk assessments and deficient knowledge regarding fall prevention (Sarmiento & Lee, 2017).

The fall risk screening tool developed for the project was adapted from the STEADI program and included 12 questions to assist with identifying fall risk factors. The screening tool was utilized by the clinic staff and providers for identifying patients at the project site who were at an increased risk for falls. The American Geriatrics Society recommends the screening of elderly patients by providers since fall risk questions can help identify new at-risk older adults who may benefit from fall prevention interventions (Hoffman et al., 2018). All the patients seen by the participating providers were screened using the fall risk screening tool, and the tool helped to identify 52.8% of the patients as being at increased risk for falls (n = 134).

Of the patients identified as increased risk for falls, providers implemented interventions

for 94% of the patients (n = 126). For patients where interventions were not taken, providers stated that they did not address the fall risk with the patient at that time as there were other identified health issues that needed to be addressed with the patient. Other studies have shown that a barrier to the implementation of fall prevention in primary care that is often mentioned is insufficient time for providers to address fall prevention with the competing demands of diagnosing and treating other specific health problems (Liddle, 2018).

The falls management protocol was intended to improve the performance of fall risk management in the primary care setting. The objectives of the project were met through the education of the clinic staff and providers as well as the implementation of the protocol at the project site. The findings of the project align with previous studies that have suggested that in order to integrate fall risk assessment and intervention into primary care practices, strategies such as education and training regarding falls and the elderly should be a requirement for healthcare providers (Howland et al., 2018). Other healthcare organizations that have implemented falls management programs have concluded that these programs can be integrated effectively into primary care settings if the programs are adapted to fit into the workflow of the practice, and training is provided along with regular re-training to maintain the program (Stevens et al., 2017b).

Significance/Implications for Nursing

Falls lead to an increase in injuries and death in the elderly population, and individuals that have fallen but not suffered an injury have limited their daily activities for fear of falling (Bhasin et al., 2018). This quality improvement project is significant for nursing because the project's outcome of improving the performance of fall risk management in the primary care setting will lead to better patient outcomes. Studies have shown that fall risk management

programs can be effective in reducing the incidence of falls and fall-related injuries in the elderly (Siegrist et al., 2016). However, other studies have also shown that fall risk management programs are not regularly integrated into clinical practice (Howland et al., 2018).

One of the roles for nurses is that of an educator, and two of the broad aims of nursing practice include promoting health and preventing illness/injury (Taylor et al., 2019). The DNP-prepared nurse is expected to use knowledge gained through research and utilize it in clinical practice to improve patient outcomes, but also to use the knowledge to mentor nurses and educate other members of the healthcare team to improve clinical practice (Chism, 2019).

The elderly may avoid discussions about falls with their healthcare provider to demonstrate the ability to maintain independence and avoid being viewed as frail (Stevens et al, 2017a). Providing healthcare providers with a means to open the dialogue of fall risk with their patients is important. The DNP project was able to educate primary care providers and clinic staff on fall risk management. Healthcare providers play a key role in education and reinforcement for their elderly patients' participation with fall prevention programs and controlling fall risk factors (Choi et al., 2019). The results of the data indicate that there was an increase in the performance of fall risk management because of the project.

Limitations

The data analysis indicate success with the quality improvement initiative; however, there were some limitations correlated with the project. Some of the limitations identified during the implementation of the project are associated with project design, sample size, and data analysis.

Project Design

An identified limitation with the project design of this DNP project is the project's implementation timeframe. The educational intervention occurred during week one of the

project, and implementation of the fall risk management protocol occurred during the following four-week period. Due to the intensive timeframe of the project, only short-term results were evaluated.

In the weeks immediately following education, there was an excellent compliance rate to the fall risk management protocol by the project participants. This compliance rate correlates to a recent research study by Cochrane contributors to identify barriers and facilitators to infection prevention and control guidelines to direct healthcare facilities during the COVID-19 pandemic. The Cochrane study found that there was an increase in compliance to guidelines immediately following training and education (Houghton et al., 2020).

A longer timeframe will be able to identify if the clinic can maintain the excellent compliance rate of performing fall risk assessments. A previous research study observed that the fall risk assessment and screening rate of patients decreased from nearly 80% in the initial twelve-month period to 49% in the second twelve-month period after implementation of a falls management program into a health system (Stevens, 2017b).

Sample Size

Another limitation with the project is the small sample size. The sample size of 8 participants was limited due to both the size of the primary care clinic and the availability of providers. Though the medical group consists of 35 clinics in the metropolitan area, the clinic site where the project was implemented was selected by the medical director due to the patient population served by the clinic. During the time of project implementation, a limitation that could not have been predicted was a provider taking emergency leave which left only two providers and 6 medical assistants to participate.

Data Analysis

As previously discussed, the entire project was completed within a five-week period. Though the data was able to successfully answer the PICOT question of whether the implementation of a fall risk management protocol would improve knowledge and performance of fall risk management by providers, data for long-term results due to project implementation are not available. The overarching aim is to reduce the incidence of falls in the elderly population for better health outcomes and to decrease medical costs related to falls. A longer timeframe of study will be able to provide an evaluation of a decrease in falls in the patient population and a decrease in costs attributed to fall-related injuries.

Dissemination

DNP-prepared leaders are expected to disseminate findings from evidence-based practice research to improve the health outcomes of populations (Moran et al., 2020). The results of the quality improvement project will be shared with the primary care clinic leadership and the medical director, as well as the providers and staff at the project site. The results of the project will also be presented through a formal presentation to the faculty and students in the Doctor of Nursing Practice program at Touro University Nevada on October 20, 2021, and the complete DNP project proposal will be submitted to the Doctors of Nursing Practice Repository doctoral project repository. Upon discussion with the project mentor and other DNP-prepared nurses, the project lead plans to disseminate the results of the project by submitting a poster presentation at the Fifteenth National Doctors of Nursing Practice Conference in Tampa, Florida to be held August 3-5, 2022. The DNP project has also been requested to be presented to the nursing faculty at the College of Southern Nevada where many members of the faculty are either DNP-prepared nurses or nurse practitioners.

Sustainability

A fall risk management protocol can help with the provision of quality patient care and decrease health care costs attributed to preventable injuries from falls. The implementation of the protocol into the primary care clinic workflow provided positive results such as improved knowledge regarding the importance of fall risk management, appropriate performance of fall risk assessment, and intervention for patients identified as increased risk for falls.

Observations and conversations with providers at the project site indicate that that utilization of the protocol may continue even though project implementation has concluded. Providers have stated they appreciated the recommended fall risk management interventions that was supplied to them as part of the project, the protocol remains posted in their rooms as reminders of interventions for patients that they identify as a risk for falls. Comments such as these demonstrate that sustainability of the fall risk management protocol is possible.

Ongoing discussions with the medical director and the project site clinic practice managers regarding the project and the results of the project support the sustainability of the protocol and the possibility of implementing the protocol at other clinic locations. Since the medical group is part of a larger multi-state healthcare system, any major initiative will require approval from administration; but the initial results of the project will help provide evidence as to the positive effects of implementing this quality improvement initiative throughout all clinics.

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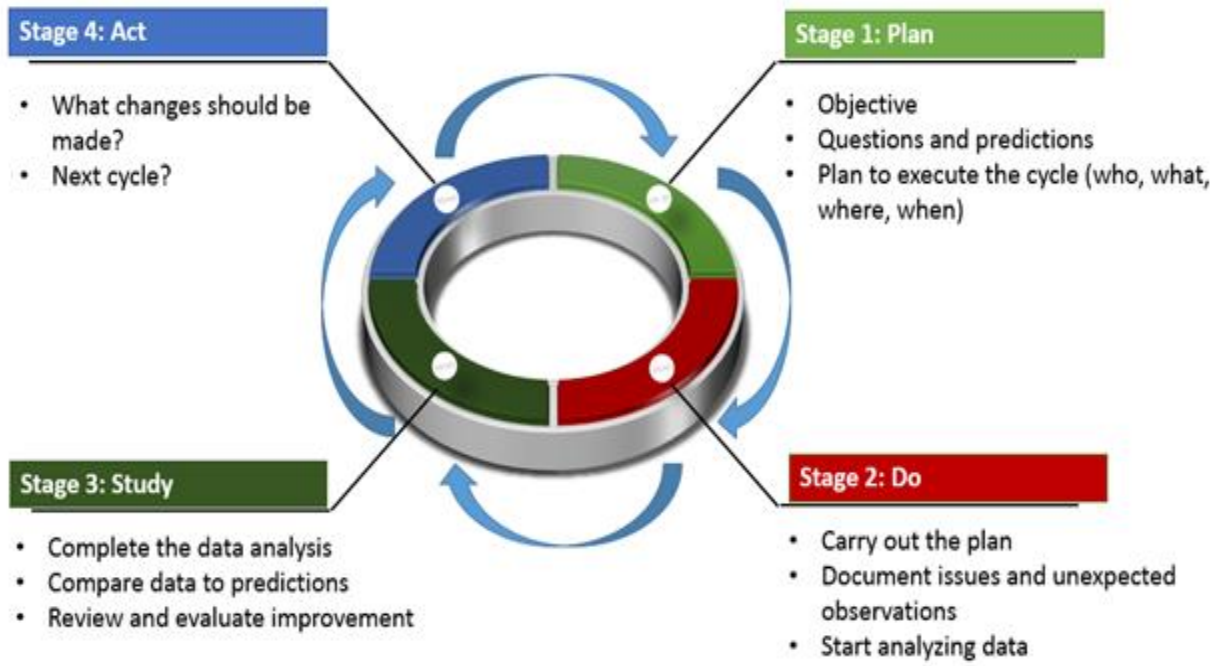
Appendix A



Dr. W. Edwards Deming's Plan-Do-Study-Act Model

Source: Compliance Online

https://www.complianceonline.com/resources/understanding-iso-13485-2016-for-compliance-and-quality.html

Appendix B

Project Site Agreement

[EXTERNAL] RE: Student Onboarding Paperwork & Information

Denise Dalzell [NV] <DDalzell@imailnv.org>
Tue 12/1/2020 10:14 AM
To: Gonzalez, Ronald <Ron.Gonzalez@CSN.EDU>

[External Email]

Ron,

Intermountain Health, formerly HealthCare Partners, has an agreement with Touro University. This agreement enables you to complete your DNP practicum at Intermountain Health.

If you need anything else, let me know.

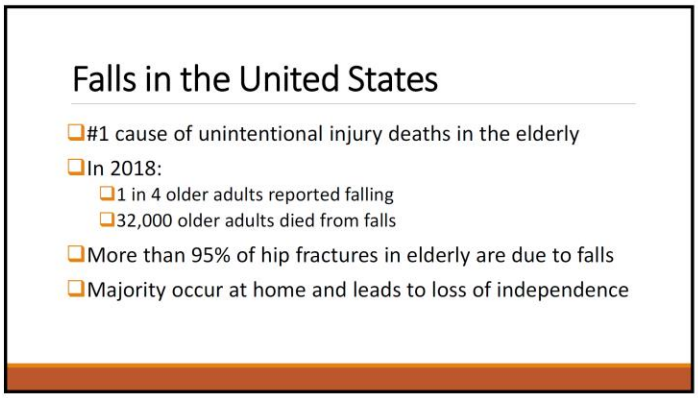
Denise Dalzell, CPCS
Provider Liaison, Provider Service
700 E. Warm Spring, Ste. 230
Las Vegas, NV 89119
Office: 702.932.8526 | Cell: 702.335.0052
ddalzell@imailnv.org
Intermountain Healthcare

Appendix C

Educational Presentation

1

2



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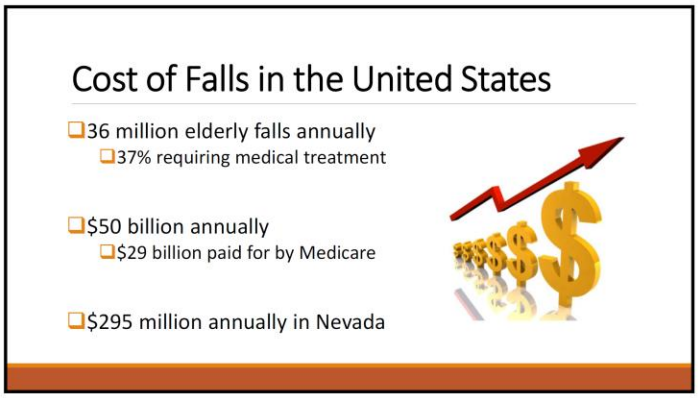


4

Health Conditions that Increase Risk

- Neurological conditions (stroke, dementia, Parkinson's)
- Depression
- Musculoskeletal disorders
- Diabetes
- Cardiac disease
- Urinary incontinence

5

Non-Modifiable Risk Factors for Falls

- Age
- Sex
- Race/Ethnicity

Older adults more likely to fall include:
- Females
- 85 years and older
- White, Hispanic, and American Indian

6

Modifiable Risk Factors for Falls

- Gait and balance issues / Limited mobility
- Lower extremity weakness
- Polypharmacy
- Orthostatic hypotension
- Visual impairment
- Foot problems / Improper footwear
- Home hazards

7

Primary Care

Half of older adults that have fallen never discuss fall issues with their provider

Providers need to screen their patients

Falls are not a natural part of aging – can be prevented by addressing modifiable risk factors

8

Falls Management in the Elderly

Screen	Assess	Intervene
Screen older adults for fall risk • At least annually • Patient reports falling • Patient has been discharged from the hospital	Assess older adult's modifiable risk factors	Intervene to reduce fall risk using evidence-based interventions

9

Overview of Assessment and Intervention

- Falls screening
- Evaluate gait, strength, and balance
- Measure orthostatic blood pressure
- Check visual acuity
- Assess feet and footwear
- Assess home safety
- Conduct medication review (Beers Criteria)
- Identify comorbidities associated with fall risk

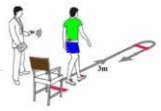
10

Fall Risk Screening Tool

- 12-question self-assessment to identify risk
  - Score $\geq$ 4 = At Risk
  - Fallen in the past 12 months = At Risk
- Identified as "At Risk" = Assess modifiable risk factors
- Select interventions to address the associated risk factor

11

Timed Up and Go Test (TUG)



- Patient starts from sitting position in armchair
- Ambulates to a mark 10 feet away and returns to sit in chair
- ≥12 seconds to complete the TUG is at risk for falling

12

Orthostatic Hypotension

- Supine for at least 3 minutes
- Sitting for at least 3 minutes
- Standing for at least 3 minutes

↓ in systolic ≥ 20 mm Hg
↓ in diastolic ≥ 10 mm Hg

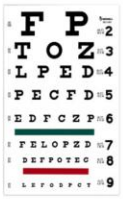
Common Causes:
- Volume depletion
- Aging
- Medications
- Neurological conditions

Interventions:
- Avoid dehydration
- Adjust medications
- Change positions slowly
- Compression stockings

13

Visual Acuity

- Ask about vision problems
- Ask about cataracts
- Ask about use of glasses
- Ask about sunglasses



Interventions:
- Optometry / Ophthalmology
- Counsel about glasses and sunglasses
- Benefits of cataract surgery

14

Feet and Footwear

- Assess for decreased sensation
- Assess for deformities
- Assess for inappropriate footwear

Interventions:
- Podiatry consult
- Counsel about footwear
  - Correct fit
  - Traction/Non-skid
  - Heel height

15

Home Hazards

- Physical therapy referral
- Tips for home safety
  - Clutter free
  - Remove rugs or use non-slip backing
  - Proper lighting
  - Use stair handrails
  - Place items on lower shelves
  - Shower mat
  - Grab bars in shower and toilet

16

Medications

AVOID
(UNLESS SAFER ALTERNATIVES ARE NOT AVAILABLE)

- Benzodiazepines
- Opioids
- Antipsychotics
- Antiepileptics
- Antidepressants

CAUTION
(ASSOCIATED WITH FALLS)

- Muscle relaxants
- Diuretics
- Anticholinergics
- Antiarrhythmics
- Antidiabetics

- Stop or taper when possible
- Switch to safer alternatives
- Reduce to lowest effective dose
- *Use clinical judgement

17

Follow-up

- 30 to 90 days post visit
- Assess and discuss barriers to adherence

18

Appendix D

CDC Permission

CDCInfo <cdcinfo@cdcinquiry.onmicrosoft.com>
Mon 3/29/2021 12:52 PM
To: Gonzalez, Ronald <Ron.Gonzalez@CSN.EDU>
Thank you for contacting CDC-INFO.
We hope you find the following information about use of CDC STEADI website materials andcontinuing education helpful.

General Use of Government Content

Most of the information on the CDC and ATSDR websites is not subject to copyright, is in the public domain, and may be freely used or reproduced without obtaining copyright permission. There are, however, a few exceptions. Visit CDC's "Use of Agency Materials" Web page (https://www.cdc.gov/other/agencymaterials.html) to learn about these exceptions, as well as the requirements that must be followed to use CDC's public domain content.

.....Original Message .....

Sent: 3/21/2021

From: Educator
Subject: CDC STEADI Initiative
Email Address: ron.gonzalez@csn.edu
Question: Greetings.

I am a Doctor of Nursing Practice student and am currently developing a quality improvement initiative to increase provider awareness and performance of fall risk management as part of my project for school. I would like permission to utilize the CDC's STEADI Initiative's educational material for providers to help with the project.

Appendix E

Falls Risk Management Test

1. Identify your position.	□ 1 = Physician □ 2 = Nurse Practitioner □ 3 = Physician Assistant □ 4 = Medical Assistant □ 5 = RN □ 6 = LPN □ 7 = Other
2. Which of the following health conditions is a risk factor for falls? (**Select all that apply**)	□ 1 = Parkinson's □ 2 = Dementia □ 3 = Depression □ 4 = Arthritis □ 5 = Cardiac disease □ 6 = Diabetes □ 7 = Urinary incontinence
3. A patient states that they have not experienced any falls, does not feel unsteady when standing or walking, but is worried about falling. Is this patient considered "at risk" of falling?	□ 1 = Yes □ 2 = No
4. What proportion of community-dwelling older Americans (age 65 years or older) fall each year?	□ 1 = 3 in 4 □ 2 = 5 in 10 □ 3 = 1 in 4 □ 4 = 1 in 5
5. In the U.S., the percent of older adults who report a fall is highest among (**Select all that apply**).	□ 1 = Women □ 2 = Men □ 3 = Adults aged 85 and older □ 4 = Caucasians
6. Which of the following activities are encouraged by the CDC for falls management in the elderly? (**Select all that apply**).	□ 1 = Screen older adults for fall risk □ 2 = Encourage older adults be vaccinated for influenza □ 3 = Assess older adult's modifiable risk factors □ 4 = Intervene to reduce fall risk using evidence-based interventions

7. According to the Timed Up and Go Test, an older adult that takes how many seconds to complete the test is at risk for falling?	□ 1 = >8 seconds □ 2 = >12 seconds □ 3 = >15 seconds □ 4 = >20 seconds
8. According to the Timed Up and Go Test, an older adult must walk to a location how many feet away from the starting point?	□ 1 = 5 feet □ 2 = 10 feet □ 3 = 15 feet □ 4 = 20 feet
9. How often should healthcare providers screen older adults for fall risk? (**Select all that apply**).	□ 1 = Monthly □ 2 = Annually □ 3 = Once in six months □ 4 = If the patient reports a fall
10. According to the CDC, when should a patient follow-up after being provided with a plan of care to prevent falls?	□ 1 = 30 to 90 days □ 2 = 6 months □ 3 = 12 months
11. Which of the following is a modifiable risk factor for falls in older adults? (**Select all that apply**).	□ 1 = Lower extremity weakness □ 2 = Age □ 3 = Limited mobility □ 4 = Orthostatic hypotension
12. Some assessments for fall risk include: (**Select all that apply**).	□ 1 = Assessment of visual acuity and vision changes □ 2 = Evaluation of home safety □ 3 = Review and management of medications □ 4 = Assessment of gait, strength, and balance
13. Which of the following are evidence-based strategies through which an older patient can reduce his or her fall risk? (**Select all that apply**).	□ 1 = Have a physical therapist conduct an in-home safety assessment. □ 2 = Walk three times a week. □ 3 = Reduce the dose of psychoactive medications. □ 4 = Participate in a strength and balance improvement program (e.g., Tai Chi).

Appendix F

FALL RISK SCREENING

(4) YES____ NO____ Have you fallen in the past year?

(2) YES____ NO____ Do you use or have you been advised to use a cane or walker?

(1) YES____ NO____ Do you sometimes feel unsteady when walking?

(1) YES____ NO____ Do you steady yourself by holding onto furniture/walls when walking at home?

(1) YES____ NO____ Are you worried about falling?

(1) YES____ NO____ Do you need to push with your hands to stand up from a chair?

(1) YES____ NO____ Do you have some trouble stepping up onto a curb?

(1) YES____ NO____ Do you often have to rush to the toilet?

(1) YES____ NO____ Have you lost some feeling in your feet?

(1) YES____ NO____ Do you take medicine that sometimes makes you feel light-headed or more tired than usual?

(1) YES____ NO____ Do you take medicine to help you sleep or improve your mood?

(1) YES____ NO____ Do you often feel sad or depressed?

_____ TOTAL POINTS

< 4	= **Not At Risk**	_____
≥ 4	= **Increased Risk**	_____

Appendix G

Fall Risk Management Interventions

FALL RISK SCREENING SCORE:_____

☐ < 4 = **Not At Risk**

☐ ≥ 4 = **Increased Risk**

SCREENED INCREASED RISK

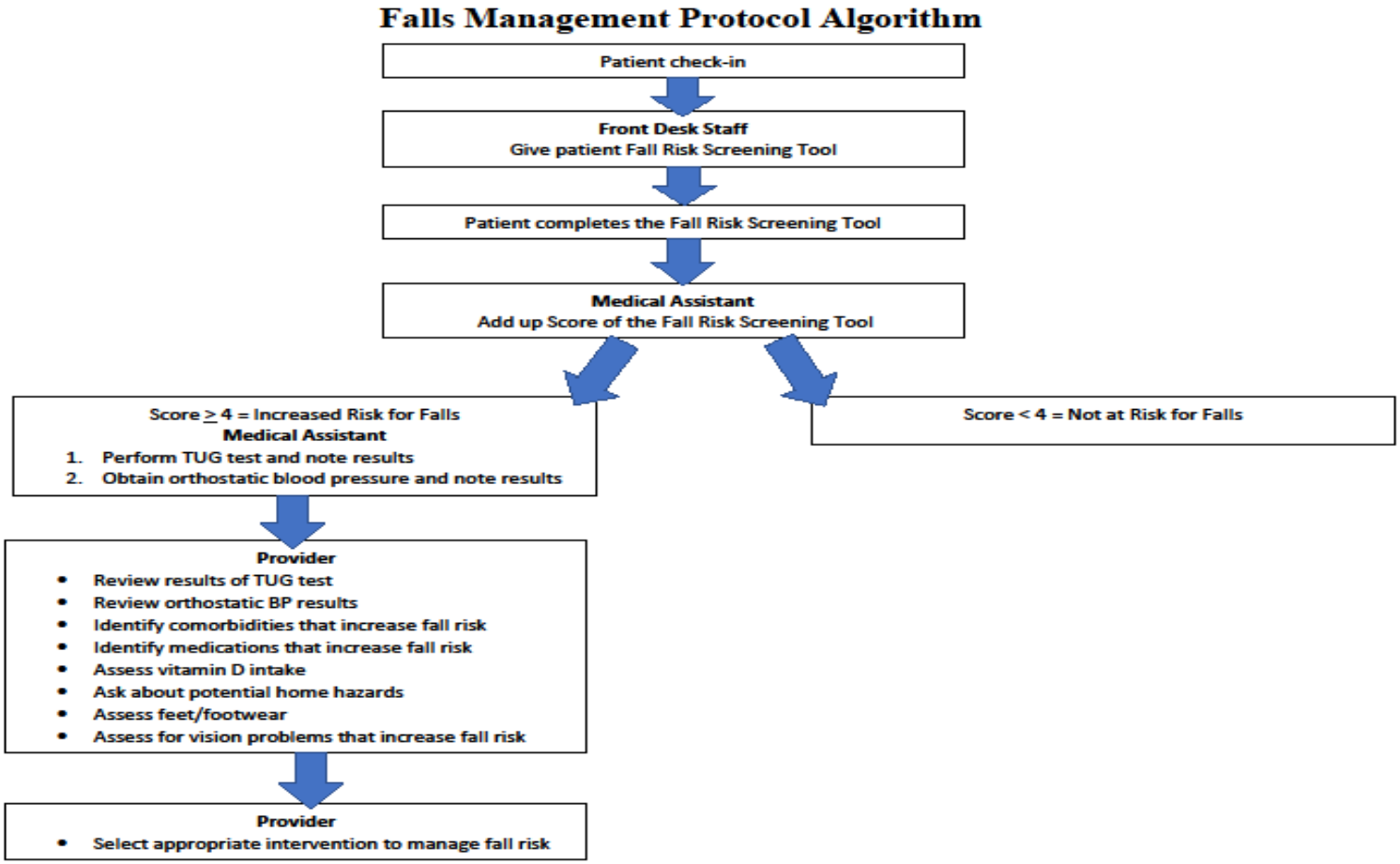
ASSESS RISK FACTORS

- ☐ Evaluate gait, strength, & balance
  - ☐ Timed Up & Go _____ seconds
- ☐ Identify comorbidities (e.g., depression, osteoporosis)
- ☐ Identify medications that increase fall risk (e.g., Beers Criteria)
- ☐ Assess vitamin D intake
- ☐ Ask about potential home hazards (e.g., throw rugs, slippery tub floor)
- ☐ Assess feet/footwear
- ☐ Assess for orthostatic hypotension (lying/sitting/standing positions)
  - ☐ Lying blood pressure _____
  - ☐ Sitting blood pressure _____
  - ☐ Standing blood pressure_____
- ☐ Check visual acuity (Snellen eye test)

SCREENED <u>INCREASED RISK</u>
INTERVENTIONS TO REDUCE IDENTIFIED RISK FACTORS

- ☐ Poor gait, strength, & balance observed
  - ☐ Refer for physical therapy
  - ☐ Order for DME
  - ☐ Patient declines DME
  - ☐ Patient declines physical therapy
- ☐ Comorbidities documented
  - ☐ Optimize treatment of conditions identified
- ☐ Medication(s) likely to increase fall risk
  - ☐ Optimize medications by stopping, switching, or reducing dosage of medications that increase fall risk
  - ☐ Patient declines intervention
- ☐ Vitamin D deficiency observed or likely
  - ☐ Recommend daily vitamin D supplement
  - ☐ Patient declines intervention
- ☐ Home hazards likely
  - ☐ Refer to physical therapy to evaluate home safety
  - ☐ Educate patient about decreasing home hazards
  - ☐ Patient declines physical therapy
- ☐ Feet/footwear issues identified
  - ☐ Provide education on shoe fit, traction, insoles, and heel height
  - ☐ Refer to podiatrist
  - ☐ Patient declines intervention
  - ☐ Patient declines podiatrist referral
- ☐ Orthostatic hypotension observed
  - ☐ Stop, switch, or reduce the dose of medications that increase fall risk
  - ☐ Educate about managing postural hypotension
  - ☐ Establish appropriate blood pressure goal
  - ☐ Encourage adequate hydration
  - ☐ Consider compression stockings
  - ☐ Patient declines intervention
- ☐ Visual impairment observed
  - ☐ Refer to ophthalmologist/optometrist
  - ☐ Stop, switch, or reduce the dose of medication affecting vision (e.g., anticholinergics)
  - ☐ Consider benefits of cataract surgery
  - ☐ Patient declines intervention
  - ☐ Patient declines ophthalmologist/optometrist referral

Appendix H


Falls Management Protocol Algorithm
Patient check-in
Front Desk Staff
Give patient Fall Risk Screening Tool
Patient completes the Fall Risk Screening Tool
Medical Assistant
Add up Score of the Fall Risk Screening Tool
Score ≥ 4 = Increased Risk for Falls
Medical Assistant
1. Perform TUG test and note results
2. Obtain orthostatic blood pressure and note results
Score < 4 = Not at Risk for Falls
Provider
Review results of TUG test
Review orthostatic BP results
Identify comorbidities that increase fall risk
Identify medications that increase fall risk
Assess vitamin D intake
Ask about potential home hazards
Assess feet/footwear
Assess for vision problems that increase fall risk
Provider
Select appropriate intervention to manage fall risk

Appendix I

Chart Audit Tool

Patient	Falls Assessment		Fall Risk Addressed	
	YES	NO	YES	NO
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