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Interdisciplinary Team Approach in Fall Prevention: Physician Perspective Focus

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Abstract

An in-hospital fall is a devastating event for patients and care providers resulting in injuries, physiological and psychological patient declines, and sometimes deaths. Furthermore, fall related costs greatly increase hospitals' expenses and cause massive distress to caregivers and health providers. Many patient-specific, organizational, and seemingly erratic factors contribute to the occurrence of in-hospital falls. Despite this, hospitals must undertake consistent evidence-based measures to prevent fall occurrences as much as possible.

The traditional nursing approach to falls prevention is not sufficient to control fall rates because the issue is too complex and must be approached from multiple perspectives rather than just nursing. Therefore, innovative practices and approaches were explored to provide additional fall preventive measures. International and local U.S. practices emphasize the importance of an interdisciplinary approach to falls prevention. This model includes multiple clinicians with diverse backgrounds, such as physicians, physical therapists, and pharmacists, who assess patient fall risks together and implement measures to effectively decrease the risks. Limited guidelines and lack of conclusive research about the interdisciplinary approach lead the team of Master of Science in Nursing Clinical Nurse Leader students to investigate the roles of multidisciplinary team members for falls prevention in great detail. As a result, a blueprint of team role descriptors was created and offered for implementation in the medical-surgical elderly client population unit.

This project provides innovative guidelines for falls prevention. These guidelines have the potential to decrease patient falls by 20-30 % in the hospital. This paper is particularly focused on the physician's role in fall prevention. In addition, this paper represents a modified compilation of current innovative hospital practices and evidence-based research findings.

Interdisciplinary Team Approach in Fall Prevention: Physician Perspective Focus

Statement of the Problem

In the United States, the topic of patient falls has remained a top interest for research and healthcare institutions for the last few decades. Despite the fact that this problem is far from new, it is still considered one of the most complex, high-risk, high-volume, and high-cost unresolved challenges hospitals face daily. To understand the urgency and complexity of the problem, it is vital to understand the definition of an in-hospital fall. According to the Agency of Healthcare Research and Quality (AHRQ, 2013), a patient fall is interpreted as an unplanned descent to the floor with or without injury to the patient. This definition suggests that hospitalized patients have a high risk of becoming the target of a fall event and suffering potentially devastating outcomes.

According to the U.S. Centers for Disease Control and Prevention (CDC, 2017), yearly falls result in more than 2.8 million injuries treated in emergency departments, including over 800,000 hospitalizations and more than 27,000 deaths. Fall prevalence is even higher among older adults, where one in three 65-year-old or older person undergoes a fall event each year. In 2012 and 2013, nearly 50,000 older U.S. adults died from injuries related to unintentional falls, which represents 55% of all unintentional deaths in this age group (Kramarow et al., 2015). As fall prevalence remains tremendously high, the fact that they cause various life-threatening injuries, such as fractures, head injuries, internal bleeding, and deaths, makes this problem a high priority.

The specific risks for falls within the elderly community is a major focus of hospital policy and research. Hip fractures are considered the most common type of serious injury caused by falls. Schnell et al. (2010) suggests that over 20% of elderly patients who sustained hip fractures die within one year of fall incidence. This assumption is concerning because every year

over 300,000 elderly patients are hospitalized for hip fractures, and more than 95% of the fractures are caused by falls (CDC, 2017). In addition, even none-injurious falls subsequently cause fear of falling in the future, which according to Scheffer et al. (2008) ultimately leads to physical, functional, psychological, and social decline in older adults. Peters et al. (2015) suggest that the relationship between injurious falls and well-being is largely the same as for non-injurious falls, except for bodily pain and social functioning, which is more impaired in patients who underwent injurious falls. Seematter-Bagnoud et al. (2006) confirm that elderly patients who experienced noninjurious falls are at greater risk for subsequent nursing home admissions, impaired socioeconomic and cognitive status.

Another burden of hospital falls is financial. Starting October 2008 Medicare and private insurance companies stopped reimbursing hospitals for the treatment of preventable fall injuries that occurred during patients' in-hospital stays. Therefore, today, hospitals are solely responsible for the costs of patient treatments and hospital stays due to an in-hospital fall occurrence. The CDC (2017) suggests that fall injuries are considered among the top 20 most expensive medical conditions. The average hospital cost for a fall injury is over \$ 30,000. Albeit the nature of falls is complicated and they appear impossible to fully prevent, the reduction of fall rates is crucial for patients and hospitals.

Problem Solutions

Considering the complexity of the falls problem, there is no unified simple solution leading to fall prevention. Fall prevention strategies are the target of multiple research studies and many of them were implemented across the country to various extents. According to the AHRQ (2013), fall preventive measures can be separated into four major categories: universal fall precautions, standardized assessment, care planning and intervention implementation, and

post-fall strategies. First of all, universal fall precaution strategies include certain guidelines applicable to all hospital patients regardless of their fall risk. They include, for instance, patient familiarization with the environment, keeping call-lights and client possessions within reach, and keeping hospital beds in their lowest position. The second category is implementation of standardized assessment of fall risk factors – a standardized process that uses assessment tools. The tools evaluate fall risk factors such as patient fall history, mobility, medications, mental status, and continence. The third category is care planning and interventions. It addresses the identified fall risk factors, and include the translation of patient assessment information into action plans that addresses patient needs. Care planning includes specific care practices implemented to reduce the likelihood of fall occurrence during hospitalization. Care plans are targeted to every unique patient risk profile and they rely on the holistic clinical picture rather than fragments of patient information. Finally, the fourth category of fall prevention strategy is post-fall procedures, like clinical review and root cause analysis. These practices help to review the immediate risk for patient injury and possible complications. They also help to understand and evaluate what events contributed to a fall and what can be done to avoid undesired outcomes in the future.

Although U.S. hospitals use all four categories of fall prevention strategies, the extent of their implementation varies widely depending on patient population, unit settings, and hospital policies. According to Hempel et al. (2013), common fall preventive strategies targeting all patients include fall risk assessment, patient and family education, and structured post-fall evaluations. Patients identified as being at high risk for falls have a number of fall prevention components, including alert signs placed on beds, doors, patient records, and call buttons in

the nurses' station. Safety and toileting rounds as well as ambulation assistance are also considered effective fall preventive measures. Multiple research studies examined and proved the effectiveness of various interventions such as bed-exit alarms, bed side rails, low beds, use of sitters, nonskid footwear, moving high-risk patients closer to the nursing station, medication review and many others.

Oxtoby (2015) suggests that when implemented on its own, no single or defined intervention has been proven effective in falls reduction. However, literature has found that systematic interventions by a multidisciplinary team can reduce falls by 20-30 %. According to the 2015 Audit Report of Royal College of Physicians (RCP), a multidisciplinary team approach is vital for falls reduction since it helps to tailor and individualize multiple interventions most effectively. Targeted interventions may range from identifying visual deficits to identifying cardiac conditions requiring surgical interventions. Therefore, a multidisciplinary approach as opposed to a traditional nursing-centered approach is more effective in falls prevention; it is more comprehensive, holistic, and individually targeted.

Literature Review

The group of Master of Science in Nursing / Clinical Nurse Leader (MSN/CNL) students worked together to form a blueprint with role descriptions of a clinical team focused on falls prevention. The overall student project was focused on the roles of a physician, pharmacist, and physical therapist. However, as the project work load and primary target were split between seven students, the literature review and focus of this paper is primarily addressing the physicians' role in falls prevention.

The literature review was conducted using PubMed and CINAHL search engine databases. Within the PubMed database, MESH terms search criteria were used to yield search

results. The keywords “accidental falls” and “physician” were used in the PubMed database. Due to limited results, no publication date restriction was applied. 63 articles were retrieved. The majority of the articles were primary studies. Utilizing the option of “similar articles” helped the effectiveness of the search. An advanced search in the CINHALL database using the Boolean phrase “falls AND multidisciplinary OR interdisciplinary AND physician” restricted to the last ten-year period provided 72 articles. Careful article analysis with the elements of *ancestry approach* helped to find citations from prior research. Sixteen articles with some degree of relevance supporting the premise of this project were found. With a lack of articles directly related to the project, relevant ideas were extracted from research to form a relatively new and unique approach for falls prevention.

The concept of an interdisciplinary approach to patient falls prevention appears logical and effective according to the literature. However, in practice, it might become challenging for caregivers not previously considered accountable for fall preventive programs to assume appropriate roles without hesitation. For instance, the performance improvement coordinator of the hospital where the study took place shared a concern that physicians do not believe that they are responsible, or have a role in hospital falls preventive practices. The problem does not appear limited to this single hospital. According to the research, physicians are quite ambivalent regarding their role in falls preventive practices.

An exploratory cross-sectional study conducted by Nyrop et al. (2012) examined physicians’ perspective on their involvement in fall prevention and provided valuable insight on the areas that indicated the need for additional dialogue with doctors. The participants of the study were 36 primary physicians working with residential-care and assisted-living patients. The primary focus of the study was examination of physicians’ past behaviors and future intentions

related to fall risk assessment and collaboration with other members of interdisciplinary team regarding reduction of patients' falls.. The findings of the study suggested that physicians assessed patients for fall risks and collaborated with other team members almost 50% less than they intended. Another focal point of the study highlighted that physicians recognized the importance of their role in fall prevention and believed they should communicate with staff regarding reduction of falls risks (5.4 out of 6), yet they expressed moderate support (4.3 out of 6) for conducting fall risk assessments by themselves. Finally, according to the study, doctors had little belief in their control over the process of communicating with staff (3.5 out of 6) and conducting patient fall risk assessments (3.3 out of 6).

These findings exemplify physicians' culture and attitudes regarding their involvement in fall prevention. More importantly, they raise the question of why physicians feel and act the way they do and what should be done to empower them to communicate with team members and provide in-depth patient assessment of fall risks. If doctors don't feel responsible and held accountable for patient fall risk assessment and communicating their findings to interdisciplinary team members, in-depth root case analysis and interventions need be initiated.

The importance of patient assessment for falls prevention cannot be emphasized enough. There are a vast number of tools, policies, and processes used by different hospitals throughout the country, although, their effectiveness may be another topic for discussion. There is strong literature support for multifactorial patient assessments by interdisciplinary team members. Doctors, pharmacists, nurses, and physical therapists all have different levels of knowledge and carry different roles in patient care. Each of them brings a unique contribution to effective patient care and fall reduction.

Hunderfund et al. (2011) conducted research to evaluate if the multidisciplinary falls

assessment by physicians and nurses could reduce patient fall rates among neurology patients. Prior to the study intervention, only unit nurses conducted fall risk assessments using Hendrich II Fall Risk Model score. During the study implementation, the assessment tool was added to the doctor's electronic admission order set, and physicians had to perform an individual fall risk assessment alongside nurses. Importantly, if there were disagreements between assessment conclusions, physicians and nurses were instructed to communicate with one another in order to reach a consensus. According to the results of the study, fall rates lowered from 5.69 to 4.12 falls per 1000 patient-days when the assessment was carried out and communicated by both a nurse and a physician.

Several factors potentially aided in the increased effectiveness of the intervention. First, while taking a patient history, physicians were able to identify fall risk factors not apparent to nurses, and not included in the Hendrich II Fall Risk Model score. Second, considering fall risk on admission affected subsequent physician decisions and medication prescribing patterns in a way that lowered fall risks. Third, physicians' assessment became a buffer in the events when a nurse did not properly, or promptly perform a fall risk assessment. Finally, as physicians became aware of patient fall risks on admission, they brought more fall risk awareness and prevention strategies to the interdisciplinary team. Study results and reasoning greatly supports the effectiveness of multidisciplinary fall risk assessments and communication.

The multidisciplinary approach is not clearly defined by hospital protocols or research. The major role in falls prevention is by and large assumed to be a nursing role; thus, much of the literature focus is on assessments, tasks, and interventions that are carried out by nurses (Hempel et al., 2013). That being said, the principles of a team approach and the continuity of patient care

warrant more holistic and shared obligations for falls prevention amongst all participants who embrace the role of a care giver during a patient's hospital stay.

One of a few studies that touched on interdisciplinary approaches for falls prevention was conducted by Smebye, Granum, Wyller, and Mellingsæter (2014). It was carried out from 2008 until 2011 in the outpatient Norwegian Falls Clinic for geriatric patients established by Oslo University Hospital. The population studied were 111 patients from Clinic with an average age 82-years-old with multiple fall risk factors including at least one chronic illness, polypharmacy, reduced walking abilities, previous falls, and injuries from falls. The distinguishing feature of the study and the Clinic itself was clear role separation between nurses, doctors, and physiotherapists.

As this project focuses largely on the specifications of potential functions and interventions for each team member, the important findings of the Falls Clinic built a foundation for staff role differentiation. According to Smebye et al. (2014), the primary role of a physician was to conduct a careful assessment of patient history, cognition, peripheral nervous system, balance and mobility, as well as a medication review. Simultaneously, physiotherapists were heavily responsible for in-depth assessments of patients' walking and balance abilities and tests of functioning. Once an interdisciplinary team conducted a patient assessment, it was then followed by a brief discussion of risk factors and recommended interventions for fall prevention. The complete list of treatments and preventive measures that the Falls Clinic practiced contained ten interventions: physiotherapy training (in 64 % of patient cases), home training programs (34 %), medication changes (25 %), Vitamin D supplementation (23 %), personal alarms (15 %), walking aid (14 %), home aid (13 %), pacemaker implantation (6 %), hip protectors (5 %) and

elastic stockings (2 %). While preparing a descriptive role blueprint, MSN/CNL students took into close consideration all Clinic's practices regarding the role of a physician in fall prevention.

Additionally, Smebye et al. (2014) raised another important point: despite frequent speculation that falls among older adults are the result of frailty, aging, and multiple risk factors, the basic elements ensuring the provision of fall prevention services must be conducted regardless. Importantly, the study stressed three major elements essential for fall prevention practices: collection thorough medical history; careful medication review – detecting possible dizziness, steadiness, and orthostatic pressure from the medication; and finally, potential cardiac and blood pressure issues. As the research authors were contacted by MSN/CNL students, more insight about the article findings adaptation to in-hospital settings were obtained and will be discussed in the result's section. This study provided a starting point and applicable evidence-based data for this project.

Another study that brought into light specifics of a physician's role in the prevention of falls was conducted by Phelan et al. (2016). The authors focused on the extent to which geriatric patients with the history of falls received multifactorial assessments and interventions. After researching 116 geriatric patients, the authors concluded that geriatric specialists performed significantly more in-depth fall risk assessment than general practitioners (4.6 vs. 3.6). As a result, the geriatric physicians were more likely to identify and implement evidence-based effective interventions.

Phelan et al. (2016) highlighted specifically abstracted fall risks, methods for their identification, and subsequent interventions that minimized patient falls. The authors identified eight major fall risk assessments, and most of them correlated with critical assessment findings recognized by the previously mentioned Smebye et al. (2014) study. According to both studies, a

patient history of falls, postural hypotension, muscle strength, gait and balance, vitamin D levels, and current medications are associated with high fall risks and therefore require close attention by a physician. Additionally, Phelan et al. identified patients' visual acuity, environmental hazards, and footwear as other crucial fall risk assessment factors.

Comprehensive assessment aids more complete and concluded interventions, which consequently results in a decrease of patient falls. Thus, this study calls attention to the basic functional characteristics of medical doctors and their role in falls prevention practices. Specific assessment and interventions discussed by Smebye et al. (2014) and Phelan et al. (2016) helped to identify the foundation of physicians' role in the assessment and implementation of fall reduction measures.

Although practice and research are not in full agreement of the ultimate role of the physician and their function in the fall prevention processes, clarity and consensus is given to the fact that a physician's scope of practice allows for the review and adjustment of patient medications. Even though nurses are responsible for medication review and obligated to consult with physicians if they have medication concerns, doctors remain the primary stakeholders of medication prescription and adjustment. In many cases, research articles highlight the importance of medication review and adjustment as one of the major physician roles for patient fall prevention.

Bell, Steinsbekk, and Granas (2015) highlighted some crucial aspects of medication review by physicians in relationship to fall risk prevention. For this qualitative study, thirteen general practitioners from Central Norway were interviewed with open-ended questions regarding prescription and cessation of fall-risk-increasing drugs (FRIDs) which included psychotropic, antihypertensive, and cardiovascular medications. The findings of the study

featured some striking trends that explained the bigger picture of a physician's modest involvement in the falls prevention process. For instance, physicians did not immediately perceive medications as an important falls factor. They also reported that elderly patients usually have numerous immediate health concerns, which due to lack of time, resulted in renewal of FRIDs with no consideration of current medications. Finally, physicians mentioned patient prescribing demands, limited patient history, and uncertainty about the outcomes of drug changes in elderly patients as other important factors preventing them from FRIDs cessation. This study exemplifies practical challenges of physician involvement into falls prevention programs. Thus, the article's findings must be taken into consideration while designing a physician's role description and more importantly, in providing them with effective tools for fall reduction.

One of the undoubtable and most unique roles of a physician in patient care is medication prescription. Physicians must recognize certain medications, high doses of medications, and particular medication interactions that increase a patient's risk for falling. Although physicians possess the knowledge to carry out the function of safe medication prescription and review, research and practice suggest that medication metabolism and their effect on elderly patients can differ tremendously from those of younger patients. Therefore, physicians may need additional support when prescribing medications associated with high fall risks.

A special psychotropic medication database with selective guidelines for elderly patients was offered by Peterson et al. (2005) as one solution. During the study, the physicians used the database for 7,456 orders of psychotropic medications for 3,718 hospitalized elderly patients. According to the study results, the guided prescription helped increase the prescription of recommended daily dose (29 % vs 19 %), reduced the incidence of 10-fold dosing (2.8 % vs 5

%), and reduced the prescription of non-recommended medications for elderly patients (10.8 % vs 7.6%). More importantly, fall rates of patients in the intervention cohort were significantly lower than those in the control cohort (0.28 vs 0.64 falls per 100 patient-days). These findings confirm the effectiveness of automated medication decision support systems for elderly patients. Overall, the study results suggest that with the growth of the aging population, it is essential to recognize the need for guidance and expert advice in regard to medication prescriptions for elderly patients in the clinical settings.

Despite limited research findings related to a physician's role in a multidisciplinary fall prevention team, the highlights from discussed articles can be used to create a physician's role description. In addition, some research trends such as physician's culture, attitudes, and feelings of powerlessness regarding their involvement in fall prevention, can help guide the organizational process of interdisciplinary team implementation.

Theoretical Framework

The problem of falls is a complex dynamic issue that does not frequently appear dependent on the efforts taken to prevent it. Therefore, chaos theory is one of the most applicable frameworks for studying and proposing approaches for falls reduction. In 1972, the founder of the chaos theory Edward Lorenz introduced the idea known as the "butterfly effect". According to his theory, a small change in the initial condition of a system can activate a chain of events resulting in large-scale phenomena; like a flap of a butterfly wings can cause subtle changes in air pressure eventually leading to a hurricane at some point in the future. Lorenz (1993) defined chaos as "processes that appear to proceed according to chance, even though their behavior is in fact determined by precise laws" (p.4). The theory is a branch of mathematics that deals with "nonlinear dynamical systems". Boeing (2015) believes that in this definition, a "system" is a set

of interconnecting components of a larger whole, while “nonlinear” means the presence of multiplicative effects between system components causing the whole to be something greater than accumulated individual parts. The problem of in-hospital falls corresponds to the idea of chaos theory due to nonlinear dynamic nature of falls within the complexity of hospital systems.

To understand the essence of chaos theory, it is crucial to understand the theory’s elements. The distinguished elements of chaos that contribute toward chaotic outcomes are dynamic systems, identified system parameters, an equilibrium state, and specific state attractors. While explaining the elements of chaos theory, Haight (2002) argued that a system should be dynamic, meaning changing with time in order for chaotic outcomes to occur. System parameters can be either temporal or spatial and their change is a fundamental element of chaos theory. Equilibrium means that a dynamic system has reached a state of minimum potential energy. Finally, an attractor is whatever a system settles down to be. Chaos theory is a mathematical mapping concept that allows the geometry of a chaotic system to be represented graphically. Therefore, as the concept of falls is multifactorial, chaos theory framework helps to map out the numerous factors that affect fall occurrence and find the equilibrium in this dynamic nonlinear system.

Methods

The performance improvement project was carried out at a large metropolitan four hundred bed hospital (Hospital). As the system assessment and literature review were conducted, it became apparent that Hospital and literature primarily focused on the elderly patient population since they appear most vulnerable to falls. More than 80% of falls in hospitals involve patients older than 65 years, and the highest risk of falls are seen in patients older than 85 years (Healey et al., 2008; Halfon et al., 2001). Thus, the primary focus of this study was shifted to the

elderly population. One of the Hospital's floors is primarily occupied by medical-surgical 65-year-old and older patients with various health conditions. Additionally, the distinctive feature of this unit is the availability of an assigned team of professionals called the Acute Care for Elderly (ACE). The team participates in daily patient care routines with a specific focus on fall prevention. As this unit fits the purpose of the study population and organization, it became the main host for the project.

A multifactorial root cause analysis was conducted and included several sources of information. First, MSN/CNL students conducted multiple interviews and journal club meetings with the Hospital performance improvement nurse co-chairing the Hospital Falls Committee. A second source was observation and active participation in daily ACE rounds for one week. MSN/CNL students collected patient information via electronic records and discussed their findings regarding patients' fall risks with a geriatric clinical nurse specialist. After this, students attended ACE rounds facilitated by a geriatric physician and a nurse specialist. Third, two local magnet hospitals were visited for assessment of their current falls preventive practices. Lastly, while performing the root cause analysis, MSN/CNL students had to heavily rely on literature reviews since very little information about the interdisciplinary approach in falls prevention is available. Weekly journal meetings with a performance improvement nurse and student team were carried out to discuss research findings. Additionally, some of the findings were discussed with the Hospital Falls Committee members. Two primary articles by Smebye et al. (2014) and Phelan et al. (2016) brought to light the functional division, tools, and interventions specific to the interdisciplinary approach and particularly the role of physicians in fall prevention. Article authors were contacted by MSN/CNL students to discuss the details of their research studies.

MSN/CNL students were unable to fully assess current physician practices and interventions in the Hospital due to lack of time and limited access to physicians. However, a detailed questionnaire and online survey were created to evaluate physician practices, perceptions, and barriers to assuming certain tasks associated with fall reduction as suggested by literature (Table 1).

Results

According to the Hospital data, the number of falls increased from 361 in 2014-2015 financial year to 428 in 2015-2016 financial year. The current Hospital goal is a 25 % and a 38 % fall reduction in 2016-2017 and 2017-2018 fiscal years respectively. Assessment of the Hospital fall preventive practices, numerous interviews, and participation in ACE rounds helped to highlight main themes associated with the interdisciplinary approach in falls prevention within the Hospital. Extensive literature reviews and interviews with researchers and managers from different hospitals helped MSN/CNL students to create a blueprint for the role of a physician participating in an interdisciplinary fall preventive team.

According to the Hospital performance improvement nurse co-chairing the Hospital Falls Committee, the two primary circumstances for patient falls at the Hospital are unassisted toileting and patient ambulation. Since nursing personnel is heavily responsible for assigned patients, the main focus of the Hospital policies and accountability for falls prevention lies on nurses. Interviews and participation in a Hospital Falls Committee meeting confirmed the absence of clear functional division for falls prevention between healthcare professionals. Heavy expectations for falls prevention is put on bedside nurses, which leads to stress, ongoing tension, and feelings of insecurity as nurses juggle numerous patient care tasks simultaneously. At the

same time, poor inter-professional communication leads to misunderstandings, ineffective exchange of information, and consequently poor quality outcomes.

Second, the results obtained from active participation and observation of ACE rounds provided valuable insight on current Hospital practices associated with the multidisciplinary team approach. Initially, MSN/CNL students were informed that ACE rounds are carried daily by the team of health care professionals that includes a physician, physical therapist, pharmacist, social worker, clinical nurse specialist, and a bedside nurse. In theory, after patient assessment, the ACE team meets and discusses their findings collectively to create a comprehensive plan to minimize patient fall risks and prevent fall occurrences. However, in reality, the ACE team only includes a geriatric physician and a clinical nurse specialist. In the best-case scenario, they perform collective patient assessments each morning with newly admitted ACE unit clients, then a nurse provides recommendations, and if necessary, a physician gives orders. Occasionally, physician and nurse specialists round alone and communicate their findings to other clinicians by paper charting or by discussing them in person. Importantly, current Hospital electronic systems do not display all clinicians' notes, and patient records are represented by a mix of paper charting and electronic charting. As a result, some patient information can easily be lost or be inaccessible to healthcare professionals. It became apparent from ACE rounds observations that the multidisciplinary healthcare team is currently incomplete and unable to communicate their findings effectively.

Although health professionals recognize the need for collective efforts to prevent falls, little is known in terms of specialized team role divisions, tools, tasks, and interventions effective from the perspective of the interdisciplinary style. The problem is common among U.S. as well

as international hospitals; thus, some innovative approaches have been taken to make up for the lack of institutional guidance and limited research findings.

MSN/CNL students contacted the authors of the Smebye et al. (2014) research article to obtain more details and information about an outpatient Falls Clinic in Norway established by Oslo University Hospital to implement an interdisciplinary approach for falls prevention among the elderly. Apparently, systematized multidisciplinary falls risk assessments and interventions are quite unique in Norway as well as in the U.S. The researchers currently take active steps to implement their practices throughout the country. Although the Falls Clinic is located in outpatient setting, the article's author confirmed that with reasonable limitations due to patient's declined health status, they practice the same assessment techniques and interventions as in acute geriatric units. The author confirmed that providing measurable outcomes for an intervention's effectiveness is challenging since the problem of falls is complex and multifactorial. However, she noted that comprehensive patient fall assessments, availability of trained geriatric clinicians, and their recommendations, brought general awareness to the problem. Moreover, these helped to allocate resources for further action plans from the perspective of general internists and even the Norwegian government. It became apparent from the researcher's feedback, that clinician communication about falls risks and falls preventive interventions is more effective and complete when the fall team is available within hospital reach.

MSN/CNL students also contacted Phelan et al. (2016) to learn more about the structured visit note template that was used for comprehensive falls risk assessments by physicians. According to one of the article's authors, an effective way to involve physicians into active participation in a fall risk preventive program was to create a clear comprehensive assessment checklist that was integrated into the electronic patient system. In addition, to minimize

physician workload yet maintain quality fall assessment, medical assistants were trained to provide low or moderate risks fall assessments. Although the study was initially carried out in outpatient geriatric settings, no measurable outcomes confirming the intervention's effectiveness is available. It is currently being tested in more acute settings. One of the emergency departments of a large trauma hospital is conducting a study on effectiveness of fall assessments and intervention protocols previously adopted in outpatient settings. Therefore, ongoing in-hospital setting research can provide more evidence-based information regarding the specifics of physician involvement in fall preventive programs.

In addition to research article authors, MSN/CNL students approached two magnet hospitals in the Bay Area (Hospital A and Hospital B) in order to interview hospital representatives regarding innovative practices and techniques related to multidisciplinary involvement. According to the risk manager of Hospital A, the multifactorial team approach and role differentiation is not a current focus of their falls preventive programs. Hospital A does not have an interdisciplinary team. The hospital's stakeholders for fall preventive approaches are nurses and physical therapists. These clinicians are using an innovative tool for more comprehensive fall risk assessments called Patient Mobility Assessment Tool (PMAT). The effectiveness of PMAT is a current subject of internal Hospital A studies. Additionally, as Hospital A's primary reason for falls is associated with delirium, there is a plan to involve a pharmacy representative for controlling medication regimens for hospitalized patients to minimize drug-to-drug and drug-to-disease interaction, as well as medication side effects on a regular basis. Hospital A approaches physician involvement by assigning a trained "physician-champion," whose focus is directed toward falls prevention. Hospital A finds this approach more practical and feasible.

Another Bay Area magnet hospital (Hospital B) is currently undergoing the process of falls prevention team building and incorporating a software tool called Targeted Solution Tool (TST). The TST helps to analyze hospital data regarding falls which occurred in the hospital. Trained house supervisors collect the data, and based on this data TST generalizes generic algorithm for falls problem solving, which include solutions and activity plans. According to the oncology unit nurse manager from Hospital B, within one month of TST generalized algorithms implementation, the number of falls in the oncology unit decreased by 25 %. There are few measures related to team effort in falls reduction undertaken by Hospital B. For instance, as the TST concluded that the largest cause for falls at Hospital B was medications, the hospital's newest policy requires the availability of a pharmacist at the nursing station daily.

Additionally, Hospital B's fall prevention focus is on spot patient education. Educational fall preventive brochures are handed out on admission. The assigned clinician rounds daily to assess patient knowledge about equipment and falls preventive measures. If there is an educational gap, primary nurses or other clinicians intervene and reinforce patient education. Physician involvement in the falls preventive program is minimized to factual awareness of patient fall risks, which is assessed by nurses and physical therapy professionals. Information about patient fall risks is communicated to physicians via their Epic electronic health record system. Ultimately, physicians are not considered stakeholders in falls preventive programs, according to Hospital B's inner policies and practices.

Careful compilation of the combined findings provided MSN/CNL students with data for creating a blueprint of a physician role description (see Table 2 for detailed physician's role description blueprint). It is important to note, that although this paper is focused on the physician's role, other MSN/CNL student team members created role descriptions for

pharmacists and physical therapists as the stakeholders of the interdisciplinary falls preventive approach.

Implementation

Based on the study results, a blueprint for interdisciplinary fall prevention program was offered to the Hospital. A limited amount of time prevented MSN/CNL students from project implementation. To assess the effectiveness of implementation and minimize initial costs, the project is planned to be implemented on one ACE unit of the Hospital among geriatric medical-surgical population. The first step of implementation is creating a viable and complete ACE team consisting of geriatric physician-champion, physical therapist, pharmacist, and geriatric clinical nurse specialist. It is important to closely assess clinicians' current practices by completing questionnaires (see Table 1). Based on the assessment results, the next steps would be questionnaire analysis and close communication with ACE team members for blueprint adjustments if necessary. As current clinical practices are more likely to differ from the suggested blueprint, it is crucial to provide comprehensive training to ACE team members. Specifically, the team will be educated on their roles, including assessment techniques, evaluation criteria for increased fall risk, and potential interventions to minimize fall risks.

The following step – exercising clinicians' roles – will include daily team rounds. The ACE team would round daily on unit patients, collectively discuss their findings, and create individualized action plans for every patient at a brief meeting. Identification of fall risk factors and team collaboration on falls preventive measures is the expected outcome of team meetings. Each healthcare professional on the ACE team will be assessing specific areas associated with falls. Depending on assessment findings, they will recommend corresponding interventions. The ACE team will be functioning on a daily basis for a period of six months. Unit

fall data will be collected and analyzed during and after a six-months period. As the most crucial goal of the ACE team implementation is the reduction of unit falls, the data from before and after modified ACE team implementations will be compared. If there is a considerable decrease in in-hospital falls on the ACE unit, the intervention may be modified for the needs of other patient populations and implemented in other Hospital units, and eventually – if successful – Hospital wide.

Cost Analysis

The cost of patient falls versus cost of ACE team labor were reviewed. According to Wong et al. (2011), in the U.S., hospital stays for fallers are on average increased by 6.3 days in comparison to non-fallers. Another Australian study by Morello et al. (2015) concluded that the mean hospital stay for non-fallers was 7.9 days, whereas for patients with non-injurious and injurious falls were respectively 18.0 and 22.5 days on average. This data suggested that even falls without injury resulted in an increased patient stay by 10 days. Patients with fall related injuries stayed 14.5 days longer than non-fallers. Considering possible disparities in healthcare practices and consequently in statistical findings, this cost analysis is based on local research and Joint Commission Center for Transforming Healthcare (2015) data that assumes the increase in hospital stay by 6.3 days on average for patients experiencing falls during their hospital stay.

The California Office of Statewide Health Planning and Development (OSHPD, 2017) concludes that the average charge per Hospital day stay is about \$15,500. Therefore, on average, each fall costs the Hospital \$97,650. As MSN/CNL students looked at the average San Francisco salaries (glassdoor.com), the yearly hospital expenses for hiring additional clinicians for the ACE team, which includes geriatric physician, physical therapist, pharmacist, and clinical nurse

specialist were \$ 228,000, \$ 92,000, \$ 150,000, and \$ 80,000 respectively, which is \$ 550,000 annually.

According to Royal College of Physicians Audit Report of 2015, multiple interventions implemented by the multidisciplinary falls prevention team can reduce falls by 20-30 %. During 2015-2016 fiscal year, the Hospital reported 356 total falls within their focus area which includes medical-surgical, psychiatric, and emergency departments. With successful implementation of the multidisciplinary approach for fall prevention, the hospital will potentially reduce the number of falls by 71.2-106.8 in the following fiscal year. This will translate into a yearly cost reduction of \$ 6.95 – 10.5 million dollars versus a \$ 0.55 million increase in labor expenses. The projected annual savings is estimated to be about \$6.4 to \$9.9 million dollars with a reduction of fall incidents by 20-30%.

Evaluation

Several factors indicative of intervention effectiveness can be discussed for implementation evaluation. First, the number of patients that were visited by ACE team members must be tracked and analyzed to identify a correlation between fall occurrence and whether or not the patients who fell were visited by the ACE team. This data will provide information about the accuracy of initial risk for falls identification and the potential for future changes if risk assessments were inaccurate. For instance, as was learned from the co-author of the research article Phelan et al. (2016) and the study called “The STEADY project at Oregon Health and Science University: Team-Based Training”, the initial fall risk patient screening can be done via fall risk assessment questionnaire. It was provided to all patients in the waiting room before admission. Having a clear screening process for fall risks is a safety net for risk patient identification and effective intervention implementation during a hospital stay. Therefore,

additional practices can be implemented alongside the project blueprint to ensure an accurate fall risk assessment.

Second, the specific actions taken by the ACE team must be considered. Analyzing and evaluating particular interventions can help to adjust or transform practices for future implementations. To understand project outcomes, it is crucial to answer several questions: if the interventions were appropriately implemented; if specific barriers hindered proper implementation; what can be done at the Hospital to make implementation effective in the future. The answers to these questions can provide valuable data regarding particular organizational and procedural adjustments necessary for project success.

A third important factor requiring evaluation is communication between the ACE team and primary care clinicians. Since the ACE team findings and care plans should be communicated to primary care staff, it is crucial to create a communication loop between them and confirm it is effective. Root cause analysis of the problem suggests that poor staff communication currently immobilizes the effectiveness of falls preventive practices. Thus, this factor affects the success of the project implementation and should be studied closely during and after project implementation.

Lastly, six months after implementation, the fall rates of the ACE unit should be compared to the baseline fall rate before the intervention implementation. As the main goal of the project is to decrease fall rates among the most vulnerable and susceptible patients to falls, an essential measure of project success is the number of ACE unit falls. According to literature, measuring the success of fall preventive programs is a difficult task since there are many factors that affect fall events. However, to understand if the project can ultimately be implemented

Hospital wide, the measurable data of falls before and after the ACE team interventions must be considered.

Discussion

Within the framework of chaos theory, multiple factors contribute to patient fall occurrences. Seemingly insignificant events, like forgetting to assess a patient's fall history or not promptly responding to a call light, may lead to serious consequences and result in a patient's physical and emotional decline. It could also result in substantial financial losses. Although it is very difficult to foresee all possible fall risk scenarios, consistent structural measures must be taken to minimize fall risks. Due to complexity and multifaceted nature of falls, no single discipline can identify and address all falls risk factors. Early interventions incorporating an inter-professional approach have proved to have great impact on falls prevention (Baxter & Maureen, 2009), yet little is still known about the specifics of the multidisciplinary team involvement. Although, latest recommendations from the AHRQ (2013), Institute for Healthcare Improvement (IHI, 2017), and Joint Commission Center (JCC, 2015) suggest that a multidisciplinary approach, as opposed to relying solely on nursing, is better, there is no clarity regarding which clinicians must be involved and what roles they should assume to minimize falls.

Research suggests that role clarity dictates if inter-professional collaboration is successful (King & Ross, 2003). In practice, even though the Hospital formally has a multidisciplinary fall team, the team members are not assigned, their roles are ambiguous, and they have little organizational guidance. To prevent falls among elderly clients, the current ACE team can increase the effectiveness of their work with additional organizational support, clear guidance, and improved communication.

There is a gap in a research and institutional recommendations in terms of identifying specific roles and interventions for multidisciplinary team members in an in-patient setting. The majority of research is directed toward the elderly population and is focused on outpatient settings. The MSN/CNL students adapted team role descriptions from outpatient research into an in-patient Hospital setting. Thus, this study offers some degree of novelty in falls preventive approaches. Piloting comprehensive multifactorial falls assessments and offering multidisciplinary interventions to minimize falls within the setting of a medical-surgical ACE unit can potentially amplify the effectiveness of fall preventive programs in the entire Hospital.

Organizational complexity at the Hospital emphasizes the challenges of quality improvement. As a patient enters a hospital, healthcare providers deal with acute and urgent aspects of patient conditions, rather than shifting the focus to the potential threats of a fall. It is expected that providers prioritize their tasks and interventions. So naturally, fall problems are moved to the bottom of priority list. Quality improvement is not a single-person task, but rather a multifactorial complex change that comes into effect only when collective efforts are applied. Therefore, without strong institutional and organizational support, the chances for a successful quality improvement intervention are small. Risk management and quality improvement interviews, as well as on-sight observation of the in-hospital work flow confirmed that strong sponsorship, Hospital leadership approval, and continuous support of the falls project are necessary conditions for desired change.

Nursing Relevance

The traditional approach identifies nurses as the main, and frequently the only, stakeholder of fall preventive measures. Multiple nursing guidelines, an infinite amount of research articles, and constantly changing internal hospital policies suggest the best fall

preventive nursing practices. Nevertheless, very little improvement has occurred. From 2005 to 2014 the number of unintentional falls death rate increased from 43 to 60 per 100,000 adults older than 65 years (CDC, 2017). The main concern is that nurses have limited influence on patient falls prevention. Research divides fall risk into extrinsic and intrinsic factors (Pearson, 2011). Controlling extrinsic factors such as poor lighting, bed height, and inappropriate footwear is within nurses reach and scope of practice. However, in terms of falls prevention, intrinsic factors such as lower extremity weakness, gait and balance deficits, vision impairment, cognitive and mental deficits, as well as polypharmacy require a more comprehensive and multifactorial effort.

This project has high nursing relevance as it helps to involve more clinicians, bring awareness, and build an internal culture of shared values amongst hospital staff members. Moreover, it increases the chances for a successful implementation of traditional nursing practices since it adds multifactorial efforts rather than just revising the current guidelines. Inter-professional collaboration is one of the core concepts in nursing standards of practice (American Nurses Association, 2015). It includes integration and sharing of skills, knowledge, values, and attitudes with other health care providers in order to improve patient outcomes. As the project focuses on the creation of a multidisciplinary effort and the promotion of shared accountability in falls preventive measures, this study will greatly potentiate nursing practices. Since nurses are one of the major stakeholders in falls preventive measures, this study provides additional opportunities for nurses to support a transition in hospital practices, participate in the creation of inter-professional collaborative environments, and most importantly, minimize disparities in the healthcare system.

Clinical Nurse Leader Relevance

With great confidence, it can be assumed that a Clinical Nurse Leader (CNL) is required for a successful implementation of this study. In the past, the Hospital had an ACE team on the geriatric medical-surgical floor. Yet without proper leadership, coordination, or supervision it fell apart. Geriatric physicians and clinical nurse specialists who partially assume a falls-champion role, currently struggle with lack of guidance and minimal support from other clinicians. The products of their effort do not fit into the clinical flow of patient care because there is no collaboration among caregivers on the subject of falls. Research suggests that even if inter-professional teams meets the conditions for collaboration, lack of organizational structure, or leadership could prevent collaboration from creating effective interactions (Bender et al., 2013). This notion echoes the Hospital's previous ACE team's experience and reaffirms the need to change how the ACE team functions and transform how the process is organized.

The CNL assumes accountability for trends and outcomes of patient care via the application of evidence-based practices (Harris, 2014, p. 10). Serving as a liaison between patients and healthcare professionals, a CNL is the only clinician specifically trained to assess at the point of care, design, implement, and evaluate patient care by active coordination, delegation, and supervision of an inter-professional team. Moreover, as effective team collaboration under CNL supervision takes place, subsequent positive patient care outcomes arise due to more transparent information exchange and controlled targeted efforts. CNL integration highly affects care quality: it improves patient satisfaction with care, admission processes, and helps to keep patients informed (Bender et al., 2012).

From the perspective of chaos theory, numerous disconnected fragments of healthcare

practice affect in-hospital falls and challenge the systemic approach of falls prevention. Thus, there is an urgent need for a designated clinician to oversee the complexity of disseminated events and circumstances, analyze them, and be prepared to lead needed interventions. A CNL has all the means necessary to effectively bring a fall project to life because he/she has the necessary time, expertise, education, and knowledge to focus on bringing the multidisciplinary team together. The CNL can make necessary changes a primary focus rather than a side project. Therefore, a CNL is a unique, suitable, and necessary participant of the project: he/she is close to the problem and has the knowledge and power to affect problem solving on multifactorial levels by calling upon a team effort.

Future Directions

With the falls project being a theoretical blueprint, practical suggestions about future directions of the study appear challenging. On one hand, if the project proves itself viable and helps to improve the fall rate on the ACE unit, the next step would be to implement the multidisciplinary team approach in other units such as psychiatric and emergency. However, considering appropriate adjustments that correspond to units' specific needs is essential to successfully implementing the project in other units. Eventually, the ultimate Hospital goal is to reduce fall rates by 25 % in 2016-2017 and 38 % in 2017-2018 fiscal years. Implementing the multidisciplinary team approach to falls across the Hospital could help them meet their goals.

On the other hand, if fall rates do not improve on the ACE unit, it does not necessary signal a failure of the project. Evaluating project outcomes and finding the setbacks to project effectiveness will provide valuable data for adjustment and transformations of the blueprint. Plan-Do-Study-Act (PDSA) Cycles offered by IHI (2017) can be used throughout the entire

project implementation phase to test which combinations of interventions have the desired effects, costs, social impact, and side effects from project implementation.

Another future prospective that will assist the effectiveness of the team approach in falls preventive programs is integrating multidisciplinary falls assessment tools and protocols into the Hospital electronic systems. Electronic decision support systems have proved their efficacy in facilitation of shared decision making. As suggested by Hunderfund et al. (2011), adding fall risk assessment tools to the physician electronic admission order set alone reduced the rate of falls by 27.6 %. In addition, Peterson et al. (2005) advised that physician use of a database of psychotropic medication dosing and selection guidelines for elderly patients through computerized order entry system helped to decrease in-hospital falls from 0.64 to 0.28 falls per 100 patient-days. Since a new electronic healthcare system will be implemented in the Hospital shortly, integration of the blueprint assessment measures, tools, and intervention guidelines might help the electronic decision support system facilitate shared decision making. Electronic system customizations and adjustments can be financially challenging for the Hospital. However, they must be considered and analyzed carefully prior to the implementation of the new electronic healthcare system as they could save the Hospital money in the future.

Lastly, as limited funds can potentially be an obstacle for project implementation, future studies might need to examine the possibility of training medical assistants or designated nurses, such as clinical nurse specialists, to provide comprehensive falls assessments. Oregon Health and Science University established the practice of utilizing medical assistants for patient fall risk assessments in the out-patient settings. They are currently piloting this practice in a large urban trauma hospital emergency department. Resistance regarding comprehensive and

time-consuming fall assessments from healthcare providers and especially from physicians is anticipated. Thus, utilization of other healthcare institutions' practices can conceivably introduce viable options for decreasing financial pressure and provider's resistance to the project implementation in the future.

Conclusion

The multifactorial nature of the fall problem challenges healthcare institutions greatly. Hospitals practice multiple strategies and implement evidence-based techniques, but the results are still far from satisfactory. Although there is no single effective solution suitable to all fall resolutions, consistent systematic approach to fall prevention is the key to maximal reduction of in-hospital fall rates. A multidisciplinary approach in fall prevention appears to represent an innovation that aligns with the core principles of patient care such as coordination, continuity, and transition of care (National Center for Interprofessional Practice and Education, 2015). The guidelines and the effectiveness of multidisciplinary teams might seem ambiguous; thus, this approach is still under development in theory and practice. Limited research focuses primarily on the elderly population in an out-patient setting. Evidence-based practices were extracted from numerous studies and transformed into functional descriptions and clinical guidelines for assessing fall risks and planning interventions from the perspective of multiple clinical specialists including a physician, pharmacist, and a physical therapist. They must be tested on the microlevel to evaluate the effectiveness of the project before changes can be implemented hospital wide.

The team of MSN/CNL students anticipate the need for further adjustments of the project blueprint during its implementation. Despite theoretical research support of the project viability,

the challenges to project implementation include obtainment of strong organizational and financial support, adjustment of the unit culture and partial transformation of current falls practices. In-hospital falls have a non-linear dynamic nature; thus, careful evaluation of hospital microsystems and the adaptation of multidisciplinary falls team practices is a key to successful project implementation.

References

- Agency of Healthcare Research and Quality (2013). Preventing falls in hospitals. Retrieved from <https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/index.html>
- American Nurses Association (2015). *Nursing: scope and standards of practice* (3rd ed.). Silver Spring, MD: ANA. Retrieved from <http://www.nursesbooks.org/ebooks/download/Nursing-Scope&Standards-3E.pdf>
- Baxter, P., Markle-Reid, M (2009). An interprofessional team approach to fall prevention for older home care clients ‘at risk’ of falling: health care providers share their experiences. *International Journal of Integrated Care*, 9, ISSN 1568-4156 – <http://www.ijic.org/>
- Bell, H. T., Steinsbekk, A., & Granas, A. G. (2015). Factors influencing prescribing of fall-risk-increasing drugs to the elderly: A qualitative study. *Scandinavian Journal Of Primary Health Care*, 33(2), 107-114. doi:10.3109/02813432.2015.1041829
- Bender, M., Connelly, C. D., & Brown, C. (2013). Interdisciplinary collaboration: the role of the clinical nurse leader. *Journal Of Nursing Management*, 21(1), 165-174. doi:10.1111/j.1365-2834.2012.01385.x
- Bender, M., Connelly, C. D., Glaser, D., & Brown, C. (2012). Clinical nurse leader impact on microsystem care quality. *Nursing Research*, 61(5), 326-332. doi:10.1097/NNR.0b013e318265a5b6
- Boeing, G. (2015). Chaos theory and the logistic map. Retrieved from <http://geoffboeing.com/2015/03/chaos-theory-logistic-map/>

California's Office of Statewide Health Planning and Development (2017). Inpatient summary reports. Retrieved <http://gis.oshpd.ca.gov/atlas/topics/use/inpatient#charts>

Center of Disease Control and Prevention (2017). Important facts about falls. Retrieved from <https://www.cdc.gov/homeandrecreationalafety/falls/adultfalls.html>

Haigh, C. (2002). Using chaos theory: the implications for nursing. *Journal Of Advanced Nursing*, 37(5), 462-469. doi:10.1046/j.1365-2648.2002.02113.x

Halfon, P., Eggli, Y., Van Melle, G., Vagnair, A. (2001). Risk of falls for hospitalized patients: a predictive model based on routinely available data. *J Clin Epidemiol*, 54, 1258-1266.

Harris, J., Roussel, L., Thomas, P.L. (2014). *Initiating and sustaining the clinical nurse leader role: a practical guide*. Sudbury, Mass.: Jones and Bartlett Publishers.

Healey, F., Scobie, S., Oliver, D., Pryce, A., Thomson, R., Glampson, B. (2008). Falls in English and Welsh hospitals: a national observational study based on retrospective analysis of 12 months of patient safety incident reports. *Qual Saf Health Care*, 17, 424-430.

Hempel, S., Newberry, S., Wang, Z., Booth, M., Shanman, R., Johnsen, B., ... Ganz, D. A. (2013). Hospital fall prevention: a systematic review of implementation, components, adherence, and effectiveness. *Journal of the American Geriatrics Society*, 61(4), 483–494. <http://doi.org/10.1111/jgs.12169>

Hunderfund, A., Sweeney, C., Mandrekar, J., Johnson, L., & Britton, J. (2011). Effect of a multidisciplinary fall risk assessment on falls among neurology inpatients. *Mayo Clinic Proceedings*, 86(1), 19-24. doi:10.4065/mcp.2010.0441

Institute of Healthcare Improvement (2017). Science of improvement: testing changes Retrieved from <http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementTestingChanges.aspx>

Joint Commission Center for Transforming Healthcare (2015). Facts about the preventing falls project. Retrieved from http://www.centerfortransforminghealthcare.org/assets/4/6/CTH_Prev_Falls_Fact_Sheet_072815.pdf

King, N., Ross, A. (2003). Professional identities and interprofessional relations: evaluation of collaborative community schemes. *Social Work in Health*, 38(2):51–7

Kramarow, E., Chen, L., Hedegaard, H., Warner, M. (2015). Deaths from unintentional injury among adults aged 65 and over. United States, 2000–2013. *NCHS Data Brief*, (119)

Lorenz, E. (1993). *The Essence of Chaos*. UCL Press, London.

Morello, R. T., Barker, A. L., Watts, J. J., Haines, T., Zavarsek, S. S., Hill, K. D., & ...

Stoelwinder, J. U. (2015). The extra resource burden of in-hospital falls: a cost of falls study. *Medical Journal Of Australia*, 203(9), 367.e1-367.e8. doi:10.5694/mja15.00296

National center for Interprofessional practice and education (2015). Picker institute's eight principles of patient-centered care. Retrieved from <https://nexusipe.org/informing/resource-center/picker-institute%E2%80%99s-eight-principles-patient-centered-care>

Nyrop, K. A., Zimmerman, S., Sloane, P. D., & Bangdiwala, S. (2012). Fall prevention and monitoring of assisted living patients: an exploratory study of physician perspectives.

Journal Of The American Medical Directors Association, 13(5), 429-433.

doi:10.1016/j.jamda.2011.08.003

Oxtoby, K. (2015). How to reduce the risk of inpatient falls. *Nursing Times*, 111(47), 22-23.

Pearson, K.B., Coburn, A.F. (2011). Evidence-based falls prevention in critical access hospitals.

Retrieved from: http://www.une.edu/sites/default/files/PolicyBrief24_Falls-Prevention.pdf

Peeters, G., Jones, M., Byles, J., Dobson, A. J. (2015). Long-term consequences of noninjurious and injurious falls on well-being in older women. *Journals Of Gerontology Series A: Biological Sciences & Medical Sciences*, 70(12), 1519-1525. doi:10.1093/gerona/glv102

Peterson, J. F., Kuperman, G. J., Shek, C., Minalkumar, P., Avorn, J., & Bates, D. W. (2005). Guided prescription of psychotropic medications for geriatric inpatients. *Archives Of Internal Medicine*, (7), 802.

Phelan, E. A., Aerts, S., Dowler, D., Eckstrom, E., & Casey, C. M. (2016). Adoption of evidence-based fall prevention practices in primary care for older adults with a history of falls. *Front. Public Health*, 4: 190-199. doi: 10.3389/fpubh.2016.00190

Royal College of Physicians (2015). National audit of inpatient falls: Audit Report 2015.

Retrieved from <https://www.rcplondon.ac.uk/projects/outputs/naif-audit-report-2015>

Scheffer, A.C., Schuurmans, M.L., van Dijk, N., van der Hooft, T., de Rooij, S.E. (2008). Fear of falling: measurement strategy, prevalence, risk factors and consequences among older persons, *Age and Ageing*, 37(1), 19–24. <https://doi.org/10.1093/ageing/afm169>

Schnell, S., Friedman, S. M., Mendelson, D. A., Bingham, K. W., & Kates, S. L. (2010). The 1-year mortality of patients treated in a hip fracture program for elders. *Geriatric Orthopaedic Surgery & Rehabilitation*, 1(1), 6–14.

<http://doi.org/10.1177/2151458510378105>

Seematter-Bagnoud, L., Wietlisbach, V., Yersin, B., & Büla, C. (2006). Healthcare utilization of elderly persons hospitalized after a noninjurious fall in a Swiss Academic Medical

Center. *Journal Of The American Geriatrics Society*, 54(6), 891-897. doi:10.1111/j.1532-5415.2006.00743.x

Smebye, K. L., Granum, S., Wyller, T.B., Mellingsæter, M. (2014). Medical findings in an interdisciplinary geriatric outpatient clinic specializing in falls. *Tidsskr Nor Laegeforen*, 134(7):705-9. doi: 10.4045/tidsskr.13.1287. eCollection 2014 Apr 8.

Staggs, V., Davidson, J., Dunton, N., Crosser, B. (2015). Challenges in defining and categorizing falls on diverse unit types: lessons from expansion of the NDNQI falls indicator. *Journal of Nursing Care Quality*, 30(2), 106-112. doi:

Wong, C., Recktenwald, A., Jones, M., Waterman, B., Bollini, M. & Dunagen, W. (2011). The cost of serious fall-related injuries at three midwestern hospitals. *The Joint Commission Journal on Quality and Patient Safety*, 37(2).

Table 1

Physician's Questionnaire for Falls Prevention Practices Assessment

	In your practice, do you have a chance to:	If you selected b or c in the column i, what are potential barriers? (select all that apply):	If you selected b or c in the column i, do you think this function fits better to the role of:
	i.	ii.	iii.
1.	Assess patient-reported history of falls by collecting medical history and circumstances around the falls occurrence (actual/potential).	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.
2.	Evaluate patient's gait and/or balance by conducting specific tests (ex.: Timed Up and Go, Romberg Test, observation of gait and/or balance).	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.
3.	Evaluate patient's lower extremity muscle strength by conducting lower extremity manual muscle test or/and evaluating sit to stand patient abilities.	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.
4.	Conduct patient cognition assessment (ex.: Mini-mental status exam, Clock drawing test).	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.
5.	Consider reduction or change of medications associated with high risk for fall such as benzodiazepines, non-benzodiazepine hypnotics, tricyclics, anticholinergics.	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.

6.	Assess patient’s postural hypotension.	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.	a. Nurse; b. Pharmacist; c. Physical therapist. d. Other _____.
7.	Evaluate patient’s visual acuity.	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.	a. Nurse; b. Pharmacist; c. Physical therapist. d. Other _____.
8.	Evaluate patient feet and/or footwear (ex.: sensory examination of feet, monofilament test, referring to podiatry consult).	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.	a. Nurse; b. Pharmacist; c. Physical therapist. d. Other _____.
9.	Evaluate patient’s vitamin D deficiency, vitamin D use, or testing vitamin D level.	a. Always; b. Sometimes; c. Never.	a. Lack of time; b. Lack of knowledge; c. Lack of need; d. Other _____; e. None.	a. Nurse; b. Pharmacist; c. Physical therapist. d. Other _____.
10.	How do you communicate your fall assessment findings and recommendations to interdisciplinary members?	<i>Please fill in your response in the space below</i>		

Note: The questions are based on the major physician’s functions related to fall prevention discussed by Phelan et al. (2016) and Smebye et al. (2014). The online survey, which is a prototype of this questionnaire, was created and posted on the www.surveypal.com website.

Table 2

Physician's Role in Assessment and Implementation of Fall Reduction Measures

Fall Risk Assessment	Assessment Definition	Evaluation Criteria for Increased Risk of Falls	Intervention
<p>Patient-reported history of falls based on questions such as:</p> <ol style="list-style-type: none"> 1. Did you fall in the last 12 months? 2. Do you feel unsteady when standing or walking? 3. Do you worry about falling? 	<p>Collecting medical history and circumstances around the fall such as: time, circumstance, direction, injuries, symptoms, other consequences.</p>	<p>At least three descriptions documented.</p>	<ol style="list-style-type: none"> 1. No specific intervention; 2. Continue in-depth assessment if patient answers YES to any of the questions.
<p>Gait and/or balance evaluation.</p>	<p>Performance of standardized tests such as:</p> <ol style="list-style-type: none"> 1. Timed Up and Go and/or; 2. Romberg Test; 3. Observation of gait and/or balance; 4. Patient's report of gait/balance problems. 	<ol style="list-style-type: none"> 1. Timed Up and Go > 15 sec; 2. Loss of balance during Romberg test; 3. Impaired gait or balance noted by provider; 4. Impaired gait or balance noted by patient. 	<ol style="list-style-type: none"> 1. Referral to physical therapy for gait or lower extremity problem; 2. Order mobility aids.
<p>Lower extremity muscle strength.</p>	<ol style="list-style-type: none"> 1. Lower extremity manual muscle test; 2. Sit to Stand ability noted. 	<ol style="list-style-type: none"> 1. 4+/5 or less on manual muscle test; 2. Difficulty performing sit to stand test due to lower extremity muscle weakness 	<ol style="list-style-type: none"> 1. Referral to physical therapy for gait or lower extremity problem; 2. Order mobility aids; 3. Order for closer observation.
<p>Cognition assessment.</p>	<ol style="list-style-type: none"> 1. Mini-mental status exam; 2. Clock drawing test. 	<ol style="list-style-type: none"> 1. < 30 points helps to identify cognitive deficits; 2. < 3 points on Clock drawing. 	<ol style="list-style-type: none"> 1. Individualized approach to every case; 2. Medication review; 3. Orders for closer patient observation

Medications associated with high risk for fall.	<ol style="list-style-type: none"> 1. Benzodiazepines; 2. Non-benzodiazepine hypnotics; 3. Tricyclics; 4. Anticholinergics; 5. Antidepressants; 6. Antihypertensives. 	Prescribed 1 or more medications that increases the risk for fall.	<ol style="list-style-type: none"> 1. Medication reduction, dosage change, or alternative medication prescription; 2. Documentation of for what reason the patient is on this medication.
<p>Postural hypotension (data can be obtained by a nurse, but analyzed by physician). Questions to consider asking:</p> <ol style="list-style-type: none"> 1. Do you feel dizzy when you first stand up from bed in the morning? 2. Do you know what to do when you feel dizzy? 	<p>Measure BP in when patient is lying down, wait for 3 minutes. Retake BP in sitting position, and after 1-3 min, take BP in standing position.</p>	A drop in systolic BP of greater than or equal to 20 mmHg or diastolic BP greater than or equal to 10 mmHg between position changes.	<p>Identify and address potential causes of postural hypotension:</p> <ol style="list-style-type: none"> 1. Medication adjustments; 2. Hydration/diet; 3. Close observation/monitoring.
Visual acuity.	<ol style="list-style-type: none"> 1. Vision exam; 2. Reported change in vision. 	Documentation of vision deficit/recent change in visual acuity.	Referral to ophthalmology or optometry consult.
Feet and/or footwear.	<ol style="list-style-type: none"> 1. Feet/footwear exam; 2. Sensory examination of feet. 	<ol style="list-style-type: none"> 1. Foot deformities or abnormalities; 2. Inadequate footwear; 3. Decreased circulation or sensation. 	<ol style="list-style-type: none"> 1. Referral to podiatry consult or monofilament test; 2. Address proper footwear and care of feet
Vitamin D.	<ol style="list-style-type: none"> 1. Query vitamin D consumption: supplements and diet; 2. Sun exposure; 3. Test vitamin D level. 	<ol style="list-style-type: none"> 1. Inadequate vitamin D intake/exposure; 2. Vitamin D lab results < 30 ng per ml. 	<ol style="list-style-type: none"> 1. Recommend vitamin D supplement of at least 800 IU/day; 2. 25-hydroxy vitamin D levels 30-70 ng/ml.

Note: This Table represents a physician’s blueprint for focused falls assessment and implementation of fall preventive measures. The components of the blueprint are adopted from Phelan et al. (2016) and Smebye et al. (2014) research articles.