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Community-Dwelling Older Adult Fall Prevention Improvement Project

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Abstract

Problem: Ground-level falls among community-dwelling adults 60 years and older are significant and contribute to adverse health outcomes such as fractures, functional decline, disability, and death. Additionally, falls among community-dwelling older adults are the number one mechanism of injury seen at a Northern California Level II trauma center. Falls often lead to post-fall fear, activity restriction, and physical deconditioning, further compounding fall risk.

Context: When trauma centers provide targeted outreach and screening for unmanaged health risks such as falls, they reduce unnecessary disability and premature death in the local population. Reducing total fall victim numbers and fall recidivism also reduces resource utilization at the acute care hospital microsystem of care level, reduces organizational operating costs and optimizes trauma patient flow from a broader, systems-based approach.

Intervention: This project improved the screening, referral, and enrollment of at-risk community-dwelling older adults into an evidence-based fall prevention program from a baseline of zero persons to ten persons per month by August 2021. The project occurred in three phases; (1) adult family medicine physician (AFMP) training and education on the existence of a quality gap, (2) AFMP education and training to address upstream, pre-fall determinants of health in older persons using the Centers for Disease Control and Prevention's Stop Elderly Accidents, Deaths and Injuries (STEADI) Fall Risk Factors Checklist (2020), and (3) enrollment of the target population into an online fall prevention program, *A Matter of Balance* (AMOB), in the Spring of 2021.

Measures: Process measures included self-reported or observed improvement in participants health status, fall-related confidence, or functional ability. Outcome measures included the percent of persons aged 60 years and older screened and referred by AFMP's. Balancing

measures included; (1) the percent of health plan members in the target population that had an eye exam in the last two years, and (2) fall prevention trainer fidelity to the AMOB program curriculum.

Results: This project saw a 65% attrition rate prior to program commencement secondary to technology limitations of participants. The remaining participant's self-reported and observed health status, fall-related confidence, and functional ability were evaluated at baseline and completion of the virtual program. At AMOB conclusion, 100% of participants reported a decreased fear of falling, 97.5% made environmental hazard reduction changes, 99.5% increased their physical activity and planned to continue exercising, and 100% would recommend the program to other older adults.

Conclusion: Reducing falls will improve upstream determinants of health, reduce resource utilization at the hospital microsystem of care level, reduce hospital operational costs, and optimize trauma patient flow from a broader, systems-based approach.

Keywords: Aging, exercise, fall prevention, falls, injury prevention, older adults

Introduction

Ground-level falls among community-dwelling adults 60 years and older are significant and contribute to adverse health outcomes such as fractures, functional decline, disability, and death. Thus, injury is a public health problem, whether measured by years of productive life lost, prolonged or permanent disability, or financial burden (American College of Surgeons-Committee on Trauma, 2014, p. 8). With one-third of older adults falling at least once per year, falls are the number one cause of mortality in older adults and account for approximately 60% of non-fatal injuries (Mielenz et al., 2017). Non-injurious falls can also debilitate older adults as they are associated with anxiety and fear of falling, which leads to activity restriction, social isolation, physical deconditioning, and depression.

Known fall risk factors include blood pressure and heart rate altering medication use, polypharmacy, poor vision, postural hypotension, cognitive impairment, lower extremity weakness, poor reflexes, abnormalities of balance and gait, foot problems, and environmental hazards (Albert & King, 2017, p. 1). When the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control published a landmark guide for community-based organizations that promote the health and well-being of residents in their community, the directive was clear, "falls will continue to increase, until a serious commitment to providing effective, fall prevention programs occurs" (Frieden et al., 2015, p. 2).

Approximately thirty-five million Americans are aged 60 years and older, and this number is expected to double in the next 25 years (National Institute of Health, National Institute on Aging, 2019, para. 1). With an aging population living longer than their ancestors before them, this larger proportion of older, community-dwelling adults necessitates a call to action for injury prevention nursing professionals (IPNP's). Historically, various types of community-based

fall prevention interventions have been used to mitigate the occurrence of falls. Currently available fall prevention programs seek to mitigate risk factors with either singular interventions such as exercise or strength training, or combinations of interventions, also referred to as multifactorial intervention. A best-practice element for any IPNP when optimizing the effectiveness of an injury prevention program to mitigate both death and non-fatal injuries is to utilize evidence-based, proven programs (American College of Surgeons- Committee on Trauma, 2014, p. 140). Choosing such programs requires a critical appraisal of available evidence to inform decision-making, an essential responsibility when selecting fall prevention activities that meet older adults' needs and preferences.

Problem Description

At this author's 140 bed Northern California acute care medical center, patients aged 60 years and older represent nearly 40% of hospitalized adults and almost half of all health care dollars spent on inpatient care (Vandergraaf, 2020a). The facility is an adult Level II trauma center with a yearly average of 1,200 trauma activations. The facility has noticed a 25% annual increase in trauma activations for ground-level falls, with over 500 activations in 2020 (Vandergraaf, 2020b). Nationally, the average fall-related length of stay (LOS) is 3-17 days (King et al., 2018, p. 1), and this acute care medical center fairs better with an average LOS of 7.5 days (Vandergraaf, 2020b). Prolonged LOS's are problematic, as they are positively correlated with adverse patient outcomes, consume healthcare microsystem resources, increase overall healthcare utilization and drive up costs which are then passed on to consumers (Lingsma et al., 2018, p. 5).

When trauma centers provide targeted outreach and screening for unmanaged health risks such as falls, they reduce unnecessary disability and premature death in their local population, a

key driver to achieving health equity in the communities they serve (Kaiser Permanente Northern

California Region Community Health, 2020). Additionally, implementing effective fall

prevention interventions can reduce total falls in the community setting and reduce fall

recidivism, or victims who experience fall-related injuries and return within one year for a

subsequent fall-related injury, by 18-22% (Howland et al., 2015, p. 4). Reducing total fall victim

numbers and fall recidivism will also reduce resource utilization at the microsystem of care level,

reduce organizational operating costs and optimize trauma patient flow from a broader, systems-

based approach.

Available Knowledge

The PICOT question used for the literature search and synthesis of evidence for this fall

prevention improvement project asks; In community-dwelling adults aged 60 years and older (P),

how does fall prevention education (I) compared to no fall prevention education (C) affect fall

risk factors (O) within a 6-month period (T)? A literature search for studies published from

January 1, 2016, through January 1, 2021, using Cochrane, Joana Briggs, CINAHL, PubMed,

and DynaMed was performed with keywords grouped according to the PICOT framework. The

main keywords included were; *elderly, muscle strength, exercise, balance, fall risk factors*,

community-dwelling, fall prevention, and *fear of falling*. These terms were connected within each

concept, and the search was restricted to systematic review or meta-analysis, critically appraised

research studies, and individual research studies. To be considered for inclusion, studies were

required to meet the following criteria; (1) community-dwelling adults aged 60 years and older,

(2) falls as the primary outcome measure, and (3) one or more types of fall prevention

interventions used. Studies were excluded if the targeted participants were not residing in the

community independently or were members of specialized populations (i.e., lower-extremity

amputations).

The initial search results from all five databases revealed over 5,000 records. Additional

screening to include only academic journals reduced the total results to 96 full-text articles.

Eliminating additional patient populations with conditions that would potentiate fall occurrence,

for instance, known gait disorders, resulted in 42 full-text articles for inclusion. Five articles

were selected for review based on their large sample size and comprehensiveness (see Appendix

A) and were then evaluated using the Johns Hopkins Nursing Evidence-Based Practice appraisal

tool (2017).

Albert and King (2017) evaluated the effects of an exercise program on reducing falls

compared to a less intensive, verbal education-only program and a control group receiving no

intervention. The authors found that combining balance, flexibility, and functional strength

training exercises reduced fall risk by 28%. Verbal education and exercise alone reduced fall risk

by 18%. Exercise-based programs demonstrated an 18% greater reduction in fall incidence

compared to verbal education-only programs.

Cheng et al. (2018) evaluated the comparative effectiveness of standard, widespread fall

prevention programs to determine the most effective interventions for preventing falls in

community-dwelling adults. The authors found that multifactorial interventions demonstrated the

highest fall prevention efficacy, followed by interventions combining verbal education and

exercise, and lastly by interventions combining exercise, hazard assessment, and modification.

Di Lorito et al. (2021) evaluated the characteristics of exercise interventions for older

adults with discrimination of specific outcome parameters (fear of falling, number of falls,

injuries, mortality, and hospital admission) that significantly improved from different

intervention characteristics such as exercise type and duration. Strength, mobility, and balance exercises delivered in a group-based intervention setting reduced overall fall risk by 32%. Muscle strengthening and balance exercises were also found to significantly decrease a person's fear of falling, the risk for injurious falls and resulting fractures, and admission to a hospital for a fall-related injury.

Sherrington et al. (2019) evaluated the benefits and harms of exercise interventions for preventing falls in older community-dwelling adults. Exercise was found to reduce the number of overall falls by 23% and the number of people experiencing one or more falls by 15%. Additionally, the authors reported that activities that involved balance, functional exercises, and resistance exercises reduced falls by 34%.

Yoshikawa et al. (2020) evaluated the effect the multifactorial fall prevention program *A Matter of Balance* (AMOB) had on the fear of falling and fall-related efficacy. The overall mean weighted effect sizes of the studies evaluated were -0.29 and 0.51. Thus, this study identified a slightly more significant program effect on reducing the fear of falling and improving fall prevention efficacy when compared to meta-analyses of other common, widely disseminated fall prevention programs.

The reviewed literature for this fall prevention improvement project demonstrates the most significant fall prevention efficacy is achieved when using multifactorial interventions that engage participants over a reasonable period of time (4 weeks) and in more than four aspects of their lives. The AMOB course curriculum uses a multifactorial approach combining verbal education, cognitive restructuring, environmental hazard reduction, strength-building exercises, range of motion, and balance exercises in a supervised, small group setting. AMOB effectiveness has been validated, with 97% of program graduates reporting they have a decreased fear of

falling, 95% having made environmental hazard reduction changes, 98.5% feeling more

comfortable about increasing physical activity, 99.5% planning to continue exercising, and

99.5% reporting they would recommend the class to other community-dwelling older adults

(Houston Health Department, 2021).

A carefully constructed fall prevention program should include an outpatient adult family

medicine physician (AFMP) pool to perform multidimensional fall risk screening assessments

using the Centers for Disease Control and Prevention's Stop Elderly Accidents, Deaths and

Injuries (STEADI) Fall Risk Factors Checklist (2020). The STEADI tool identifies persons at

risk for falls using a combination of elements such as balance, gait, vision, postural blood

pressure, medication, environment, cognition, and psychological health (see Appendix B). The

AFMP is an essential touchpoint in fall prevention as they have regular, upstream engagement

with older persons pre-fall event. Once older persons have been screened and deemed to be at

risk, a subsequent referral into AMOB can be made by the AFMP.

Rationale

This fall prevention improvement project will be using the Health Belief Model (HBM), a

widely used theoretical framework for guiding health promotion, disease prevention, and

developing interventions to facilitate behavior change and reduce the fall risk in the target

population (see Appendix C). Derived from psychological and behavioral theory, the HBM is

rooted in two foundational components of health-related behavior; (1) a person's desire to avoid

illness, or conversely, get well if already ill, and (2) a person's belief that a specific health action

will prevent, or cure, illness (Boston University School of Public Health, 2019).

Throughout the 1950s, the United States Public Health Service observed a widespread

failure of people to voluntarily participate in disease prevention activities and early disease

detection screening tests (Hochbaum et al., 1974). To better explain this phenomenon, four social

scientists from the U.S. Public Health Service developed the HBM, and its following constructs;

(1) perceived susceptibility- how much risk there is in acquiring an illness or disease, (2)

perceived severity- how serious an illness or disease can be, (3) perceived benefit- what effect

the actions taken will have on reducing the illness or disease, (4) perceived barriers- self-

imposed obstacles to performing a recommended health action, (5) cue to action- the stimulus

needed to accept a recommended health action, and (6) self-efficacy- the level of a person's

confidence in their ability to perform a behavior successfully. The first four constructs were

developed as original tenets of the HBM, and the last two were added as research on the HBM

evolved (Boston University School of Public Health, 2019).

The indication and applicability of the HBM to fall prevention is based on Shankar et al.

(2017), who found that many older adults consistently deny the personal relevance of education

on fall prevention interventions and do not appreciate that falls are a public health crisis (p. 232).

The HBM framework guides fall prevention in several ways; (1) it informs participants about the

risks for falls and fall-related harm through relatable, physical, and psychological constructs, (2)

it educates participants on simple prevention strategies they can perform within their setting, (3)

it encourages the belief that they can be successful if they participate in and adhere to fall

prevention activities, and (4) it facilitates participant involvement, providing a cue to action

through messaging, direct engagement and logistical support.

The significant barriers to adopting fall prevention activities, even after a fall, include; (1)

low self-efficacy, (2) sedentary behavior, (3) belief that a program will not work, (4) low health

expectations, (5) denial of risk, (6) not wanting to be stigmatized as a participant, and (7) failure

to change behavior (Mielenz et al., 2017, p. 331). The HBM will be used to target these barriers

and measure fear of falling, environmental hazard reduction, changes in physical activity levels, and endorsement of fall prevention education to similar older adults.

Specific Project Aim

The specific aim for this fall prevention project is to improve the screening, referral, and enrollment of community-dwelling adults aged 60 years and older who are at risk for falls into an evidence-based fall prevention program from a baseline of zero persons per month to 10 persons per month by August 2021.

Context

The purpose of this Northern California Level II trauma center's microsystem is to represent the primary structure and means for leading region-wide trauma care along the continuum for injured persons. The microsystem includes the clinical personnel and administrative support resources necessary to ensure the appropriate and efficient provision of optimal multidisciplinary trauma care (see Appendix D). In the early 1980s, macro-level trauma systems were created in California to reduce injury severity and frequency of occurrence. Within those systems, designated and scaled (I highest-IV lowest) trauma centers employ highly trained multidisciplinary trauma clinicians.

A Level II trauma center is clinically equivalent to a Level I trauma center except for a few limited scenarios such as amputations requiring replantation, burns greater than 20% total body surface area, complex pediatric trauma, and the performance and publishing of scientific research. Such distinguishing differences do not relieve a Level II trauma center from system-wide leadership should a higher-level trauma center be non-existent in the geographic catchment area. When a Level I trauma center does not exist in the same geographic area as a level II, cooperation, communication, and system-wide leadership is required of the Level II center in

order to ensure optimal trauma care and injury prevention is provided to the community

(American College of Surgeons- Committee on Trauma, 2014, p. 3).

A high functioning trauma system's ultimate goal is to decrease the risks for and the

burden of injury as a disease to individuals and the community (American College of Surgeons-

Committee on Trauma, 2014, p. 13). Such a goal cannot be achieved by simply providing

optimal care to injured persons; it requires representation and coordination in all trauma care

continuum phases (see Appendix E). Effectively managing, tracking, and maturing partnerships

with internal and external stakeholders is crucial to the success of an IPNP's efforts to mitigate

the most common causes of injury seen at their trauma center (American College of Surgeons-

Committee on Trauma, 2014, p. 141).

High-functioning teams require robust and effective leadership to form, perform and

sustain. Leadership is the act of influencing another's behavior, and through the actions of that

other, the leader's ideas and vision become a reality (Stedham & Skaa, 2019, p. 1). Therefore, an

IPNP Clinical Nurse Leader must focus on leading the lateral integration of care services

described by King, Gerard, and Rapp (2019), specifically, coordinating the wellness of persons

by managing, monitoring, and influencing microsystem environments to influence a person's

health and quality of care received across the continuum (p. 425).

With ground-level falls among community-based adults representing the most common

mechanism of injury seen at this author's medical center, opportunities to implement community-

based fall prevention efforts present themselves consistently and uniformly. Historically, health

education activities have been popular among older community-dwelling adults in the local

geographic service area. There is a constant need for increased labor and infrastructure to keep

up with the demand. Therefore, partnerships have been established with the medical center's in-

house volunteer labor pool to serve as additional fall prevention coaches in the future. Increasing

the number of fall prevention instructors can create substantial injury prevention momentum, and

the department of trauma will continue seeking new community partners who can help maximize

the geographic footprint of injury prevention efforts.

Trauma injury prevention is acutely married to a culture of safety, which is a pillar of

overall success in trauma centers. When a safety culture is implemented poorly, it is a valid

justification for the loss of trauma center designation status by regulatory bodies such as the

American College of Surgeons. To ensure a culture of safety, departmental performance

improvement (PI) activities are performed in accordance with the Institute of Medicine's six

quality aims for patient care; safe, effective, patient-centered, timely, efficient, and equitable

(Agency for Healthcare Research and Quality, 2018). To ensure loop closure on clinical

processes, patient outcomes, and systems issues related to the care of injured persons, the

department of trauma has numerous initiatives and strategies in various stages of development.

All initiatives and strategies in use support and validate the importance of coordinating,

managing, monitoring, and influencing the microsystems of care to ensure the best standards of

trauma care are met as the injured patient transitions through each of them.

When performing the unit profile assessment, periodic trends and common patterns for

safety and PI were noted to not only meet but exceed peer-to-peer trauma center benchmarks.

The trauma department leadership staff optimize clinical best practices through multidisciplinary

rounding, trauma education for clinical personnel, multiple PI review levels, and have a robust

injury prevention program that addresses the top half-dozen mechanisms of injury seen. In the

clinical specialty of trauma, measuring performance, processes, and outcomes is complex, as it

requires more than one individual or microsystem to resuscitate, repair, and rehabilitate injured

persons. Dr. Avedis Donabedian's (Types of Healthcare Quality Measures, 2015) model is a

helpful framework for evaluating the quality of care applied to a continuous trauma system PI

cycle. Should failure on the part of the IPNP to influence the trauma continuum occur, it will

translate directly to measurable adverse outcomes. Examples include; (1) unwanted, off-target

trending of injury prevention activities that are reflected in institutional data collection and

survey methods, (2) numbers of injury prevention interventions performed, and (3) outcomes

observed in targeted audiences, such as measured knowledge or behavior change.

To successfully reduce actual or potential harm and improve outcomes, this trauma

microsystem recognizes the following metrics as essential; (1) the monitoring and measuring of

specific process and procedure outcomes related to trauma care; (2) the usage of process and

outcome core measures (referred to as audit filters, which use defined criteria for institution-

specific clinical practice guidelines); (3) inclusion of non-discretionary core measures long-

established by the American College of Surgeons; (4) documentation of core measures findings

in the trauma Performance Improvement Patient Safety (PIPS) plan; and (5) annual review of the

trauma PIPS plan. These metrics are subjected to a multidisciplinary peer review process

outlined in the trauma PIPS plan to identify variances in care and causative factors. This process

then guides improvement opportunities as needed.

To optimize the quality of injury prevention practices and patient care outcomes

implemented in the local community, the IPNP combines the trauma PIPS plan and the HBM.

The trauma PIPS process is dynamic, prescriptive, multidisciplinary, and system-oriented. It is

integrated into the hospital's PI program and individualized to the trauma microsystem to identify

variances in care across the continuum. The trauma PIPS plan is overseen by a trauma PI

manager/registered nurse who works collaboratively with the IPNP to identify and track trends

across the trauma continuum. The IPNP then evaluates identified trends through the lens of the

HBM to guide health promotion, injury prevention, and interventions for missed opportunities

identified in the PIPS process. The goal of combining the trauma PIPS plan with the HBM is to

facilitate behavior change before the identified injury type occurs again.

      This fall prevention improvement project was assessed for internal and external factors

that could be considered facilitators and barriers to implementation. A SWOT (strength,

weakness, opportunities, threats) analysis was used to help identify those factors (see Appendix

F). Project strengths include; (1) hospital leadership support, (2) organizational financial support,

(3) use of a multifactorial fall risk assessment, (4) use of an evidence-based fall prevention

program curriculum, and (5) the lateral integration of interdisciplinary stakeholders. Project

weaknesses include; (1) variable outpatient compliance with fall prevention activities, (2)

AFMP's who are already task saturated from managing the complex needs of patients, (3)

insufficient numbers of fall prevention trainers to facilitate multiple, concurrently running fall

prevention classes, and (4) a pandemic-dictated virtual fall prevention delivery platform that

eliminates target population members who are not technologically savvy or in possession of

computer equipment. Project opportunities include; (1) reduced fall-related injuries and

recidivism, (2) reduced resource utilization at the microsystem level of care for fall-related

hospital admissions, (3) reduced organizational operating costs for fall-related hospital

admissions, and (4) optimized trauma patient flow from a systems-based approach. Project

threats include; (1) the trauma center's role as a regional leader is at stake, (2) legal implication-

related fall risk culpability, (3) the potential loss of trust from residents in the geographic service

area, and (4) sustained or increased numbers of victims seen at the trauma center for fall-related

injuries.

AMOB was initially designed by physical therapists at Boston University who worked with older adults afraid of falling. Over time, the curriculum developed into a lay-leader model, enabling the recruitment, training, and implementation of the program at various sites and settings across the United States with help from volunteer trainers. This program development allowed licensing and content distribution by Maine Health, one of five state-sponsored Area Agencies on Aging, a subset of the state of Maine's Department of Health and Human Services (Maine Department of Health and Human Services, 2021), to anyone who pays the one-time fee of $2,000 per person to be a Master Trainer (MT). After 20 hours of instruction, the fee provides the licensing approval, fall prevention information, MT certification, and materials to implement AMOB classes in the community. As a result, the MT is authorized to; (1) recruit and train volunteer lay Coaches to lead AMOB classes, (2) coordinate the program in any community, (3) market the program to older adults, and (4) evaluate fall prevention education outcomes.

Financial analysis of this fall prevention improvement project revealed no identifiable costs associated with training the AFMP pool to perform fall risk screening. A needs assessment was performed in the spring of 2021 via electronic mail to the lead physician responsible for the hospital-associated AFMP pool. The communication survey had a simple intent, to ascertain if standardized training was currently in place for the AFMP pool to screen older adults for fall risk. The needs-based survey identified the collective AFMP pool as needing education and training on performing multifactorial fall risk screenings. The education and training were provided in a single session webinar in accordance with the IPNP's regular assigned duties. There were also no identifiable costs associated with developing and distributing fall prevention marketing materials, acquiring the technological devices needed to facilitate virtual classes, or

labor costs, as these functions are in accordance with the IPNP's job description and were performed during regular business hours.

Potential organizational cost savings from fall prevention education is difficult to determine accurately. Howland et al. estimated annual cost savings for fall recidivism, using 100 hypothetical patients who had presented to an emergency department for a fall-related injury, and assumed that all victims were referred to, but only 50% completed AMOB, giving a calculated return on investment (ROI) for AMOB at 144 % (2015). Savings ranged from $2.79 million, assuming a 25% participation rate, to $8.37 million, assuming a 75 % participation rate (Howland et al., 2015, p. 5).

Intervention

This fall prevention improvement project synthesized data from fall risk factors, multidimensional assessments, and targeted interventions and apply them to community-dwelling older adults. A cooperative agreement with the AFMP pool was established in the Spring of 2021. The AFMP pool committed to performing multifactorial fall risk screenings using the STEADI Fall Risk Factors Checklist and then referring at-risk older adults to the IPNP for enrollment into the AMOB program (see Appendix G). The AMOB fall prevention program was selected for this project because currently available literature demonstrates it has the highest fall prevention effect, acknowledges the omnipresent risk of falling, and emphasizes practical coping strategies to reduce the fear of falling.

Due to a 25 times increase in risk for hospitalization and a 440 times increase in risk for death for persons over 50 years of age who contract COVID-19 (Centers for Disease Control and Prevention, 2021), the first AMOB program will be held via socially distanced webinars for the first Plan, Do, Study, Act (PDSA) cycle. The internet-based learning platform was tested for

internal and external validity during the initial 12 months of the COVID-19 global pandemic by Maine Health and was determined to have preserved fall prevention efficacy.

Changes to test include; (1) participant understanding that falls and the fear of falling are controllable, (2) setting of realistic goals for increasing physical activity, (3) modification of hazards in the participant's environment to reduce fall risk factors, and (4) understanding how exercise can increase strength and balance. Essential program components and activities that validate the changes to test include; (1) group discussion, (2) problem-solving, (3) skill-building, (4) assertiveness training, (5) exercise training, (6) sharing practical solutions, and (7) cognitive restructuring—learning to shift from negative to positive thinking patterns. The length/timeframe of the program is 18 hours (divided into nine virtual sessions) over five weeks, with a 12-person participant maximum.

Study of The Intervention

In preparation for a summer 2021 AMOB program launch, the study of the intervention for this fall prevention improvement project was performed weekly. During weekly meetings with microsystem leadership, there were ample opportunities to discuss project objectives and timelines to avoid scope creep as the project progressed. Open dialogue and shared governance are crucial at this stage because leaders and stakeholders need to have a shared vision of the project and how it will contribute to overall organizational goals for injury prevention (Agency for Healthcare Research and Quality, 2017, p. 18). A clearly outlined priority for organizational leadership was understanding what specific systems and processes will change and who would carry out those changes. The communication channels created during this process will continue to be reinforced throughout the sustainment phase of this project.

A good study design for outcomes evaluation will produce valid and defensible results. This fall prevention improvement project is prospective and measures the outcome of interest, and the intervention received prior, during, and after the 18-hour fall prevention program. Additionally, internal validity was noted to be strong due to the non-existence of other fall prevention programs offered in the geographic service area.

This fall prevention improvement project is intended to be ongoing; therefore, small tests of change are expected to happen periodically. PDSA cycles for this project will focus on the coordination of care with AFMP's, program content delivery platforms, and target population participation. The IPNP will use a quarterly, logical review of the implemented changes to study results, such as the prevalence of falls per 1,000 trauma activations pre-and post-implementation, to assess if falls and severity of injury from falls have decreased. Assessment data becomes the input for the next step in the cycle. Standardized organizational tools and spreadsheets will also graph the data and present a visual picture of project performance status. Specific measurement strategies for this improvement project can be found in the Fall Prevention Improvement Project Charter (see Appendix H).

Measures

The outcome measure for this improvement project is the number of persons aged 60 years and older who are enrolled into AMOB after being screened and referred by AFMP's. The data source is a web-based registration platform, and the target for the outcome measure is a 10 times increase from the current baseline of zero.

Qualitative process measures that describe how AMOB benefits the participants include; (1) self-reported and (2) fall prevention coach observed improvement in the participant's health status or functional ability. Data sources include; (1) a physical activity readiness questionnaire

(see Appendix I), (2) an initial session survey with questions regarding fall prevention, physical

activity levels, and background information (see Appendix J), (3) the last session survey to

compare evaluative change (see Appendix K), and (4) a class evaluation with questions

concerning comfort in talking about fear of falling, changes made to their immediate

environment, comfort in increasing activity levels, plans to increase activity levels, and

background information (see Appendix L). The target for the self-reported and observed

improvement in fall-related health status is 50% of the class participants from a baseline of zero.

Quantitative process measures include data collected by microsystem registrars in the Trauma

One Registry (see Appendix M), such as trauma activation type, mechanism of injury, age,

gender, location the injury occurred, and injury severity score. These process measures will then

be analyzed and interpreted by the IPNP via the trauma PIPS process.

Balancing measures for this project include; (1) maintaining fidelity to the program

curriculum by delivering AMOB content according to the program developers intended design

and protocols and (2) adjudicating the number of persons aged 60 years and older in the IPNP's

geographic service area that have had an eye exam in the last two years. Data sources will

include; (1) microsystem leadership spot checks and reports outs by the AMOB MT (the IPNP),

and (2) use of the Slicer Dicer feature in the organization's electronic healthcare record (EHR).

Slicer Dicer is a built-in EHR tool used to explore patient denominators based on user criteria

that identifies patients fitting a specific condition. The target for balancing measures includes; (1)

100% adherence to fidelity, and (2) at least 40% of adults aged 60 years and older in the

geographic service area having had an eye exam in the last two years.

Ethical Considerations

Cura personalis, a Latin term that translates to "care for the entire person," is an Ignatian value woven deep into the fabric of professional nursing. Nurses are passionate about caring for and valuing others. A core value and assumption that underscores the professional nurse's contract with society is that the nurse practices with compassion and respect for every person's inherent dignity, worth, and unique attributes (Haddad & Geiger, 2021). A nurse must have a high level of respect for all individuals and understand that patients have the right to decide on their participation in care, known as self-determination.

A core biomedical ethic, autonomy, can also be applied to fall prevention by IPNP's because an older person's knowledge, behavior, beliefs, skills, motivation, and resources can influence their attitudes and decision-making about fall prevention participation or avoidance. Older persons may reject fall prevention education and disassociate themselves from the "older" label and associated ageist stereotypes if they perceive it as a potential threat to their identity and autonomy (Worum et al., 2020, p. 2). The willingness to take up fall prevention measures depends on various personal factors, the quality of the information provided to them, guidance and decision-making, the type of fall prevention program being offered, and their social support system. Managing on their own, retaining dignity, and not feeling like a burden to others have been identified as paramount quality of life elements for older persons (van Leeuwen et al., 2019, p. 21).

Effective communication and provision of information are fundamental principles of IPNP work in injury prevention activities. Caring for the whole person in a way that preserves their dignity, autonomy, and self-determination can enable older persons to make informed

decisions about fall prevention education and positively receive public health messages intended for them.

This project has been approved as an evidence-based quality improvement project by the University of San Francisco faculty using QI review guidelines. It does not require IRB approval (see Appendix N).

Results

The outcome measure for this improvement project was the number of persons aged 60 years and older enrolled into AMOB after being screened and referred by the AFMP pool. The data source was a web-based registration platform, and the target for the outcome measure was a 10 times increase from the current baseline of zero. After providing education and training to the AFMP pool on April 1, 2021, using the STEADI Fall Risk Factor Checklist, 28 at-risk older persons were referred for enrollment in AMOB within 30 days, allowing the first virtual 18-hour class to begin on June 1, 2021. The percentage of persons aged 60 years and older who were screened and referred by AFMP's for this PDSA cycle represented a 280% increase from a baseline of zero, far surpassing the target goal of 10.

Of the participants who completed the AMOB program, self-reported and observed improvements in participants' health status, fall-related confidence, and functional ability were validated with 100% reporting a decreased fear of falling, 97.5% made environmental hazard reduction changes, 99.5% increased their physical activity and planned to continue exercising, and 100% reported they would endorse the class to other community-dwelling older adults. The change in self-reported and trainer-observed improvement in fall-related health status represented a 195-200% increase from the baseline of zero, far surpassing the target goal of 50%.

In order to identify and ensure AMOB implementation is not negatively impacted by poor vision, a specific fall risk factor affecting all older adults, the percentage of health plan members aged 60 years and older in the geographic service area that have had an eye exam in the last two years was evaluated as a balancing measure. Using Slicer Dicer, 33,000 health plan members in this age group had an office visit encounter with ophthalmology or optometry over the past two years. With 72,000 health plan members aged 60 years old or greater in the geographic service area, this accounts for 45.7% of the target population, indicating no unintended consequences were introduced into the system during project implementation.

Frequent spot checks from a third party independent, in-organization AMOB MT occurred weekly during the 18-hour program. Fidelity to the program curriculum is essential as this variable may not only moderate the relationship between fall prevention education and its intended outcomes of reducing fall risk, but its assessment may also prevent potentially false conclusions from being drawn about AMOB's effectiveness. Therefore, fidelity to the program curriculum was set at a target goal of 100%, and sponsor spot checks and report-outs by the AMOB program MT occurred consistently, achieving the target goal.

Discussion

Summary

When community-dwelling older adults experience a fall or have a fear of falling, they may respond by curtailing their activities, which has the opposite effect, increasing their risk of falling. Such compensatory mechanisms compromise social interactions and increase their risk of isolation, depression, and anxiety. However, utilizing the available literature to guide best practices, fall prevention strategies can have favorable short and long-term effects.

Multifactorial evidence-based fall prevention programs like AMOB are shown in the available research to reduce falls. Therefore, it is not necessary to use participant's self-reported falls as an outcome measure. Instead, AMOB can change people's attitudes, beliefs, and behavior (intermediate outcomes) by using short-term goals. The effectiveness of AMOB is typically measured by intermediate outcomes, such as improvements in functional abilities, improved balance, and greater self-confidence, which in turn leads to changes in mortality and morbidity (long-term outcomes). The long-term outcomes can then be used to demonstrate the value of an organization's work to the public (Frieden et al., 2015, p. 32).

The virtual AMOB platform created by Maine Health in the era of COVID-19 is designed to achieve the same outcomes as the traditional, in-person program and maintain fidelity to the original curriculum design. In this first PDSA cycle, continuity with curriculum design intent was observed to be consistent and without disruption despite noting few considerations.

A common challenge facing the cohort enrolled in the virtual AMOB program centered on concerns regarding technology; all students were not fully confident in learning about and adequately using web-based platforms for fall prevention education. Participant apprehension eliminated 65% (18) of the 28 persons screened to be at risk for falls because they could not or would not meet the technical requirements before program commencement. Even for those with sufficient financial resources, older persons are among the least technologically savvy group in any given population, creating a risk that the digital transformation of fall prevention education could become more of a disruption than enablement for this demographic.

A recent report from the Pew Research Center confirmed that "digitally ready" Americans – meaning those who are confident in their online digital navigation skills- tend to be disproportionately under 65 years of age (2017), which is below the target population age range

for fall prevention education. However, due to the increased risk for COVID-19 exposure from

in-person classes at project implementation, program content was required to be delivered

through a web-based platform.

Economic inequality can impair access to technology-based learning platforms for

socioeconomically depressed racial groups, rural area living, or persons with lower levels of

education and income who often struggle to afford medication, food, and shelter. Such upstream

determinants of health suggest that any additional financial burden of purchasing hardware, such

as a computer, and the internet access required to use it, makes this form of fall prevention

education a luxury some cannot afford. In addition to technological challenges, older persons

often have physical challenges that make online learning difficult, such as reduced reactivity

times and visual and hearing impairment. Such collective challenges illuminate the significant

gap between the potential benefits offered by technologies and the barriers that plague older

adults in adopting these technologies. Notably, while some older adults are eager to adopt new

technology and learn new educational platforms, IPNP's should first attempt to identify an older

person's perceptions of technology before implementing web-based fall prevention education.

Early identification will assist with introducing and maximizing the potential of technology to

this population.

As of June 15, 2021, the Governor of California terminated the executive orders that put

the Stay Home Order and the Blueprint for a Safer Economy into place. At this writing, 87.2% of

the United States population over the age of 65 has received at least one COVID-19 vaccination,

and 77% are fully vaccinated (Centers for Disease Control and Prevention, 2021b). The

California Governor also phased out the vast majority of executive actions put into place since

March 2020 as part of the pandemic response, leaving a subset of provisions that facilitate the

ongoing recovery related to masking and mega-events, pending an expected update by the

Centers for Disease Control and Prevention (Official California State Government Website

[CA.GOV], 2021). These developments may lead to in-person AMOB program options for

subsequent PDSA cycles, pending any regression in the epidemiologic management of COVID-

19.

<div align="center">**<u>Conclusions</u>**</div>

While sustaining change logically follows initial improvement, it is essential to engage

and develop interdisciplinary professional relationships that complement IPNP fall prevention

activities to ensure sustained effective community outreach. Due to the constant rotation of

persons in key positions, strategic and creative fall prevention partnerships require upkeep to

meet organizational goals. Laterally integrating external injury prevention stakeholders, such as

senior housing or public health representatives, can optimize the effectiveness of community-

dwelling older adult fall prevention. Furthermore, collaborating with internal stakeholders, such

as AFMP's or similar clinicians who have upstream, pre-fall touchpoints with at-risk older adults,

can potentiate fall prevention effort spread. Perfection in fall prevention is not achievable.

However, in combination with a continuous quality improvement process, multifactorial fall

prevention interventions are shown to significantly lead to improved quality of life, physical

health, and overall well-being of community-dwelling older adults.

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Appendix A

Evidence Table

Study	Design	Sample	Outcome/Feasibility	Evidence Rating
Albert & King (2017). Effectiveness of statewide falls prevention efforts with and without group exercise. *Preventive Medicine*, *105*, 5–9. https://doi.org/10.1016/j.ypmed.2017.08.010	Quasi-experimental	1,998 adults aged 60 years and older in three groups: exercise-based, education-based and control	Exercise-based programs vs. education-based programs demonstrate an 18% greater reduction in falls incidence. Programs with 2 or more categories of exercise achieve a statistically significant reduction in rate of falls. This supports using a multifactorial/comprehensive fall prevention program.	Level- 2 Quality- B
Cheng et al. (2018). Comparative effectiveness of published interventions for elderly fall prevention: a systematic review and network meta-analysis. *International Journal of Environmental Research and Public Health*, *15*(3), 1–14. https://doi.org/10.3390/ijerph15030498	Systematic review and meta-analysis	49 RCT's- 27,740 adults aged 60 years and older	Multifactorial interventions (combining 3 or more interventions such as exercise, environmental hazard reduction, education, etc.) demonstrated the highest falls efficacy. This supports multifactorial approaches for fall prevention as more effective than single intervention strategies.	Level-1 Quality- A
Di Lorito et al. (2021). Exercise interventions for older adults: A systematic review of meta-analyses. *Journal of Sport and Health Science*, *10*, 29–47. https://doi.org/10.1016/j.jshs.2020.06.003	Systematic review of meta-analyses	367,171 adults aged 60 years and older	Strength, mobility, and balance exercises reduced falls by 32-35%. Exercise significantly decreased the risk of injurious falls and resulting fractures. Supports the integration of physical exercise with falls prevention education. Also supports physical exercise as a method to decrease fear of falling, risk of injurious falls and likelihood of hospital admission.	Level-1 Quality- A

Study	Design	Sample	Outcome/Feasibility	Evidence Rating
Sherrington et al. (2019). Exercise for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews*, (1). https://doi.org/10.1002/14651858.CD012424.pub2	Systematic review and meta-analyses	108 RCT's-23, 407 adults aged 60 years and older	Balance training and functional exercises reduced falls risk by 24% and the number of people having 1 or more falls over the course of one year by 13%. This supports activities involving balance, functional and resistance exercises as effective in reducing falls.	Level- 1 Quality- A
Yoshikawa et al. (2020). Systematic review and meta-analysis of fear of falling and fall-related efficacy in a widely disseminated community-based fall prevention program. *Archives of Gerontology and Geriatrics*, *91*, 1–13. https://doi.org/10.1016/j.archger.2020.104235	Systematic review and meta-analyses	17 studies (Experimental, Quasi & RCT's)-3,860 adults aged 60 years and older	Identified a slightly larger program effect on reducing fear of falling and improving fall related efficacy when compared to meta-analyses of other common, widely disseminated fall prevention programs. This supports using the *A Matter of Balance* fall prevention program.	Level-1 Quality- A

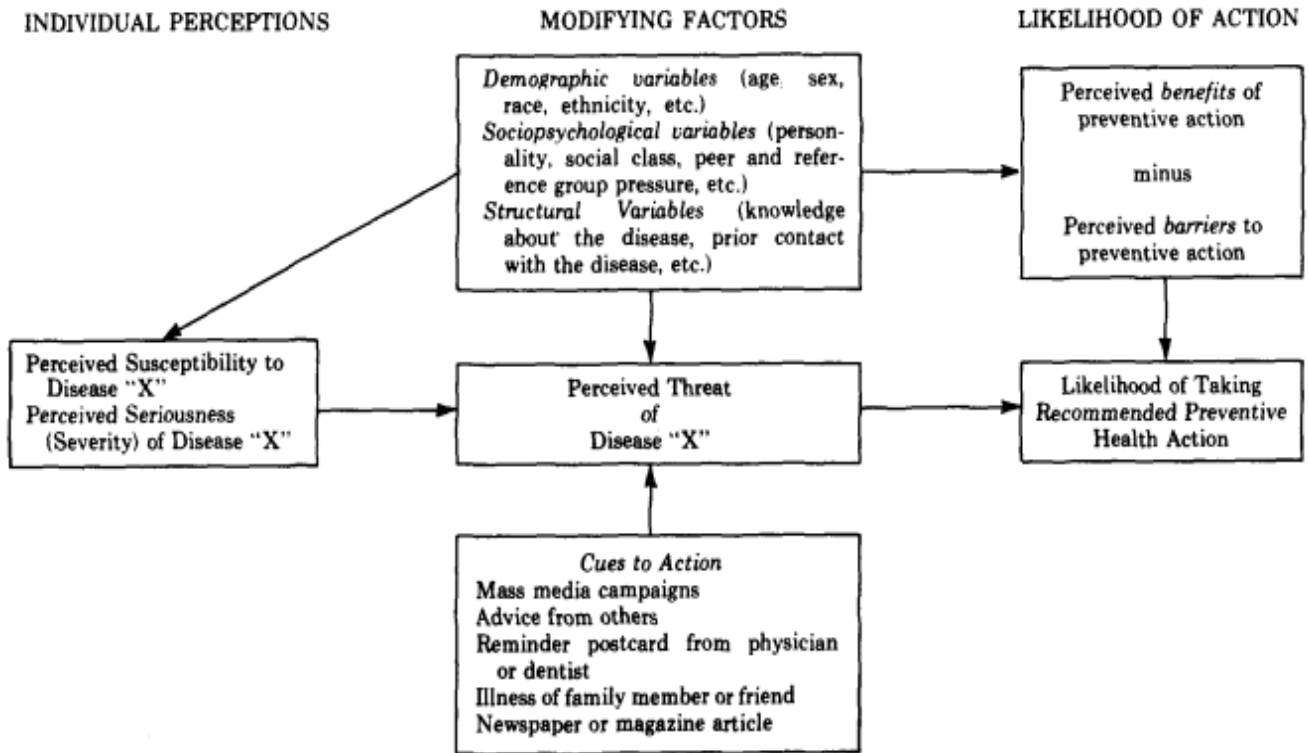**Appendix B**

STEADI Fall Risk Factors Checklist

CHECKLIST

Fall Risk Factors

Patient _____

Date _____

Time _____ ☐ AM ☐ PM

Fall Risk Factor Identified	Present?		Notes
FALLS HISTORY			
Any falls in past year?	☐ Yes	☐ No	
Worries about falling or feels unsteady when standing or walking?	☐ Yes	☐ No	
MEDICAL CONDITIONS			
Problems with heart rate and/or arrhythmia	☐ Yes	☐ No	
Cognitive impairment	☐ Yes	☐ No	
Incontinence	☐ Yes	☐ No	
Depression	☐ Yes	☐ No	
Foot problems	☐ Yes	☐ No	
Other medical problems	☐ Yes	☐ No	
MEDICATIONS (PRESCRIPTIONS, OTCs, SUPPLEMENTS)			
Psychoactive medications	☐ Yes	☐ No	
Opioids	☐ Yes	☐ No	
Medications that can cause sedation or confusion	☐ Yes	☐ No	
Medications that can cause hypotension	☐ Yes	☐ No	
GAIT, STRENGTH & BALANCE			
Timed Up and Go (TUG) Test ≥12 seconds	☐ Yes	☐ No	
30-Second Chair Stand Test: Below average score based on age and gender	☐ Yes	☐ No	
4-Stage Balance Test: Full tandem stance <10 seconds	☐ Yes	☐ No	
VISION			
Acuity <20/40 OR no eye exam in >1 year	☐ Yes	☐ No	
POSTURAL HYPOTENSION			
A decrease in systolic BP ≥20 mm Hg, or a diastolic BP of ≥10 mm Hg, or lightheadedness, or dizziness from lying to standing	☐ Yes	☐ No	
OTHER RISK FACTORS (SPECIFY BELOW)			
	☐ Yes	☐ No	

Source: Centers for Disease Control and Prevention, National Center for Injury Prevention and

Control, 2020

Appendix C

The Health Belief Model

INDIVIDUAL PERCEPTIONS   MODIFYING FACTORS   LIKELIHOOD OF ACTION

	Demographic variables (age, sex, race, ethnicity, etc.) *Sociopsychological variables* (personality, social class, peer and reference group pressure, etc.) *Structural Variables* (knowledge about the disease, prior contact with the disease, etc.)	Perceived *benefits* of preventive action minus Perceived *barriers* to preventive action
Perceived Susceptibility to Disease "X" Perceived Seriousness (Severity) of Disease "X"	Perceived Threat *of* Disease "X"	Likelihood of Taking Recommended Preventive Health Action
	Cues to Action Mass media campaigns Advice from others Reminder postcard from physician or dentist Illness of family member or friend Newspaper or magazine article	

Source: Hochbaum, Kegeles, Leuenthal, & Rosenstock, 1974

Appendix D

Microsystem Unit Profile

Supporting Microsystem Profile

A. Purpose: Why does your microsystem exist?

Name of Service: Trauma Administration	Site Contact: Evan Edminster	Date: September 20, 2020
Service Manager: Amy Brammer	Service Lead: Amy Brammer	

B. Know Your Customers: Take a close look into your microsystem; create a "high-level" picture of the Customers that you serve. Who are they? What resources do they use/request? How do customers view the services they receive?

Est. Distribution of workload	%	List Your Top 10 Work type requests		Top requesting Customers	Customer Satisfaction Scores	% Excellent
Source- Performance Improvement Coordinator	45	1.Trauma education for clinical staff	6. SME presentations at conferences & events	Chief Nurse Executive/Chief Nurse Operations Officer	Experience via phone	98%
Source- Trauma Education, Injury Prevention, Outreach Coordinator	50	2. Performance improvement review & corrective actions	7. Media work (videos, newspapers, radio, etc)	Department directors, managers, staff & work groups	Length of time to get complete work	98%
Source- Trauma Data Registrars	5	3. Injury prevention programs	8. Disaster mgnt SME drills	Local, regional & state-level key stakeholders	Accuracy of work	98%
Source-		4. Community outreach & brand ambassadorship	9. Coordination of care across the continuum	Other internal groups or personnel	Satisfaction with personal manner	98%
Source-		5. Local, regional, state-level policy & process work	10. Report outs	External groups or person	Satisfaction with work product	98%

		Customers who are frequent users of your service and their reasons for interacting with your microsystem	Other services you interact with regularly as part of your normal work processes.	Workload distribution: Do these numbers change by season? (Y/N)	#	Y/N
Est. # of work requests in last month	14			Workload in a day	N/A	
				Workload in last week	N/A	
		ED, ICU, OR, MS, Tele, Acute Rehab- The clinical microsystems of care where our patients reside	RT, Supply, Cardiology, Neurosurgery, Orthopedics, Plastics, Optho, Vascular, Nephrology, Head/Neck, Blood Bank	Workload in last month	N/A	

Top Payors					Other	
KP Senior Advantage (KP assigned Medicare)- 30%						
Medicare- 10%						
Other/No Health Plan- 10%						

Complete "Through the Eyes of Your Customer

C. Know Your Professionals: Use the following template to create a comprehensive picture of your microsystem. Who does what and when? Is the right person doing the right activity? Are roles being optimized? Are all roles who contribute to the patient experience listed? What hours are you open for business? What is the morale of your staff?

Current Staff	FTEs	Role/Function		Days of Operation	Hours of Operation
Enter names below totals (Use separate sheet if needed)				Monday	07:00-17:00
				Tuesday	07:00-17:00
Microsystem Total	6.0			Wednesday	07:00-17:00
				Thursday	07:00-17:00
Title: Trauma Program Director	1.0	Responsible for operational, personnel and financial aspects of the trauma program.		Friday	07:00-17:00
Amy				Saturday	24 hr on call administrator support
Title: Trauma Education, Injury Prevention, Outreach Coordinator	1.0	Provides analytical support, coordinates trauma education, injury prevention, community outreach & brand ambassadorship.		Sunday	24 hr on call administrator support
Eva				Which activities are you involved in? Check all that apply.	
Title: Performance Improvement Coordinator	1.0	Provides analytical support, coordinates trauma quality management & performance improvement.	☐ Electronic Work Request	X- E-Mail (with customers)	
Jess			X- Data Management	X- Microsoft Teams	
Title: Trauma Registrar	1.0	Provides specialized research, analytical & reporting duties.	X- Certification	X- Other- Telephone	
Am					
Title: Trauma Registrar	1.0	Provides specialized research, analytical	X- Regularly attend clinical microsystem	☐ Other-	

Source: Northern California Adult Level II Trauma Center, 2021

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Appendix D (Cont.)

Microsystem Unit Profile

		& reporting duties.		meetings you are supporting	
Title: Office Coordinator	1.0	Administrative support and general office duties.		X- Leadership meets regularly with clinical microsystems being supported	

Work Type	Cycle Time		Comment		
Trauma Education, Injury Prevention, Outreach	1 day – 1 quarter		Project cycles vary on the complexity of the project deliverables	Do you use a Float Pool?	☐ Yes X- No
Performance Improvement	1 day- 1 quarter		Project cycles vary on the complexity of the project deliverables	Do you use On-Call?	☐ Yes X- No
Staff Satisfaction Scores			**%**	Do you use Per Diems?	☐ Yes X- No
How stressful is this microsystem?		% Very stressed	50 (3/3 very stressed)		
Would you recommend it as a good place to work?		% Strongly Agree	83.33 (1/6 disagrees)		

*Each staff member should complete the Personal Skills Assessment and "The Activity Survey"

D. Know Your Processes: How do things get done in the microsystem? Who does what? What are the step-by-step processes? How long does it take to complete the work here, are the delays? What are the "between" microsystems hand-offs? Have you discussed a shared purpose with clinical microsystems and other supporting microsystems?

1. Track cycle time from work requested, work assigned, work completed, final product sent to customer.
2. Complete the Core and Supporting Process Assessment Tool

E. Know Your Patterns: What patterns are present but not acknowledged in your microsystem? What is the leadership and social pattern? How often does the microsystem meet to discuss processes? Are customers involved? What are your results and outcomes?

• **Does every member of the microsystem meet regularly as a team?** Yes, trauma administration staff meet formally every month for 2 hours and informally numerous times per week as all our offices are geographically proximal to each other and we all encourage, and participate in, drop-in style collaboration.	• **Do the members of the microsystem regularly review and discuss errors, safety and reliability issues?** Yes, every month we have a peer-review quality forum and every quarter we have a multidisciplinary quality forum which includes our microsystem as well as all stakeholders from the other services we collaborate with regularly.	• **What have you successfully changed?** We have numerous improvement projects that we have accomplished to include video recording in the trauma bay, online trauma academies, one on one trauma tutoring with clinical staff and board certification improvement projects on our journey to magnet status. • **What are you most proud of?** The redesigning and rollout of trauma education for clinical staff which included increased trauma nursing board certification numbers on our journey to magnet status
• **How frequently?** See above.		• **What is your financial picture?** Positive. 2019 operating cost for KP were 81.8 billion with 7.4 billion net income at 5,5% market growth per year.
• **What is the most significant pattern of variation?** Clinical nursing staff continue to contribute to CAUTI's, HAPI's and HAP's in our poly trauma and spinal cord injured patients. Structure, process and outcomes-focused performance improvement strategies have been implemented.		***Complete "Metrics that Matter"**

Source: Northern California Adult Level II Trauma Center, 2021

Appendix E

The Preplanned Trauma Care Continuum
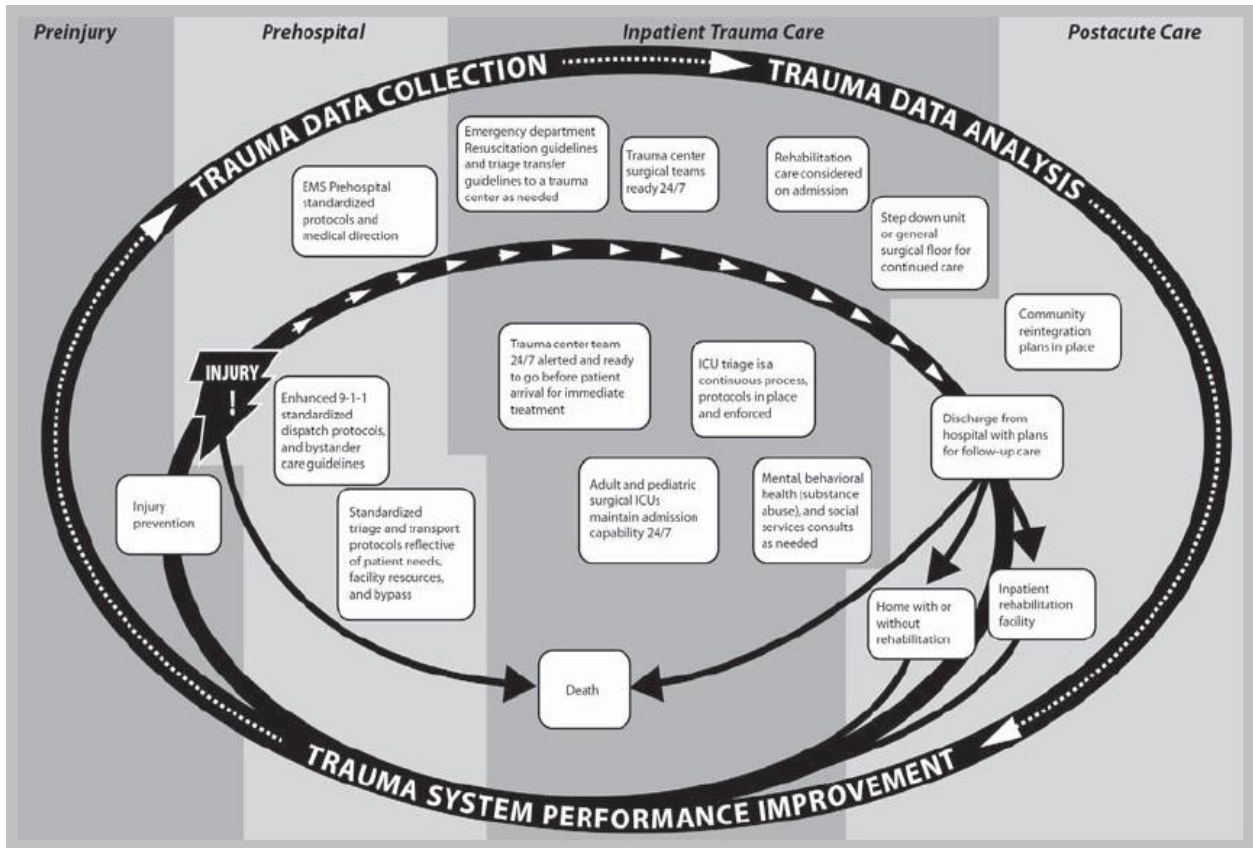
Source: American College of Surgeons- Committee on Trauma, 2014, p. 13

Appendix F

SWOT Analysis of Fall Prevention Improvement Project

- Helpful   - Harmful   **INTERNAL**   **EXTERNAL**

- Reduced fall-related injuries and recidivism

- Reduced resource utilization at the microsystem level of care for fall-related hospital admissions

- Optimized trauma patient flow from a systems-based approach

Opportunities

Weaknesses

- Hospital leadership support

- Organizational financial support

- Multifactorial fall risk assessment

- Use of evidence-based, pre-established fall prevention curriculum

- Interdisciplinary stakeholder buy-in

Strengths

Threats

- Outpatient compliance with fall prevention activities

- AFM Physicians task saturated managing complex needs of patients

- Insufficient numbers of fall prevention coaches/master trainers to run numerous, concurrent fall prevention classes

- COVID-19 dictated virtual learning platform eliminates target population members who are not tech savvy or possessing equipment

- Trauma center's reputation as an area leader at stake

- Legal implication-related fall risk culpability

- Loss of trust from residents in the geographic service area

- Sustained or increased trauma activations for falls

Source: Northern California Adult Level II Trauma Center, 2021

Appendix G

A Matter of Balance Fall Prevention Class Flyer

Source: Maine Department of Health and Human Services, 2021

Appendix H

Fall Prevention Improvement Project Charter

Project Charter: Community-Dwelling Older Adult Fall Prevention Project Charter

Global Aim: To reduce total falls, unnecessary disability, fall recidivism and premature death in the aging population.

Specific Aim: To improve the screening, referral and enrollment of community-dwelling adults aged 60 years and older who are at risk for falls into an evidence-based fall prevention program from a baseline of zero persons per month to 10 persons per month by August 2021.

Background: Each year one in four older adults fall, resulting in 29 million falls, seven million of which lead to a healthcare encounter and/or voluntary restriction of daily activity (Centers for Disease Control and Prevention. National Center for Injury Prevention and Control, 2019, p. 12). Nationally, the average fall-related inpatient hospital length of stay (LOS) is 3-17 days (King et al., 2018, p. 1). Prolonged LOS's are problematic, as they consume healthcare resources, increase overall healthcare utilization, drive up costs, and are positively correlated with adverse patient outcomes (Lingsma et al., 2018, p. 5).

When medical centers provide targeted outreach and screening for unmanaged health risks such as falls, they reduce unnecessary disability and premature death in the local population, a key driver to achieving health equity in the community they serve (Kaiser Permanente Northern California Region Community Health, 2020). When trauma centers utilize effective fall prevention interventions, they reduce total falls in the community setting and reduce fall recidivism, or victims who experience fall-related injuries and return within one year for a subsequent fall-related injury, by 18-22% (Howland et al., 2015, p. 4). This project will implement the *A Matter of Balance* (AMOB) fall prevention program to address fall risk factors,

perform multidimensional assessments and provide target interventions to older, community-dwelling adults. Fidelity will be ensured by way of Master Trainer (MT) report outs to organizational injury prevention sponsors.

Sponsors:

Trauma Program Director	A.B.
Trauma Medical Director	C.B.
Chief Operating Officer	C.C.
Chief Nurse Executive	C.S.

Goals: Targeted screening, referral, and implementation of an evidence-based fall prevention program in a 140 bed, Northern California Level II trauma center's local area community. Upon fall prevention program completion participants will; (1) view falls and the fear of falling as controllable, (2) set realistic goals for increasing physical activity, (3) modify the participant's environmental and home hazards to reduce fall risk factors, (4) increase strength and balance through exercise, and (5) reduce the participants risk for falling.

Measurement Strategy

Background (Global Aim): To reduce total falls, unnecessary disability, fall recidivism and premature death in the aging population.

Population Criteria: Community-dwelling adults aged 60 years and older, ambulatory, able to problem-solve, concerned about falls, interested in improving flexibility, balance and strength.

Data Collection Method: Data will be collected from reports run from the electronic trauma data management registry.
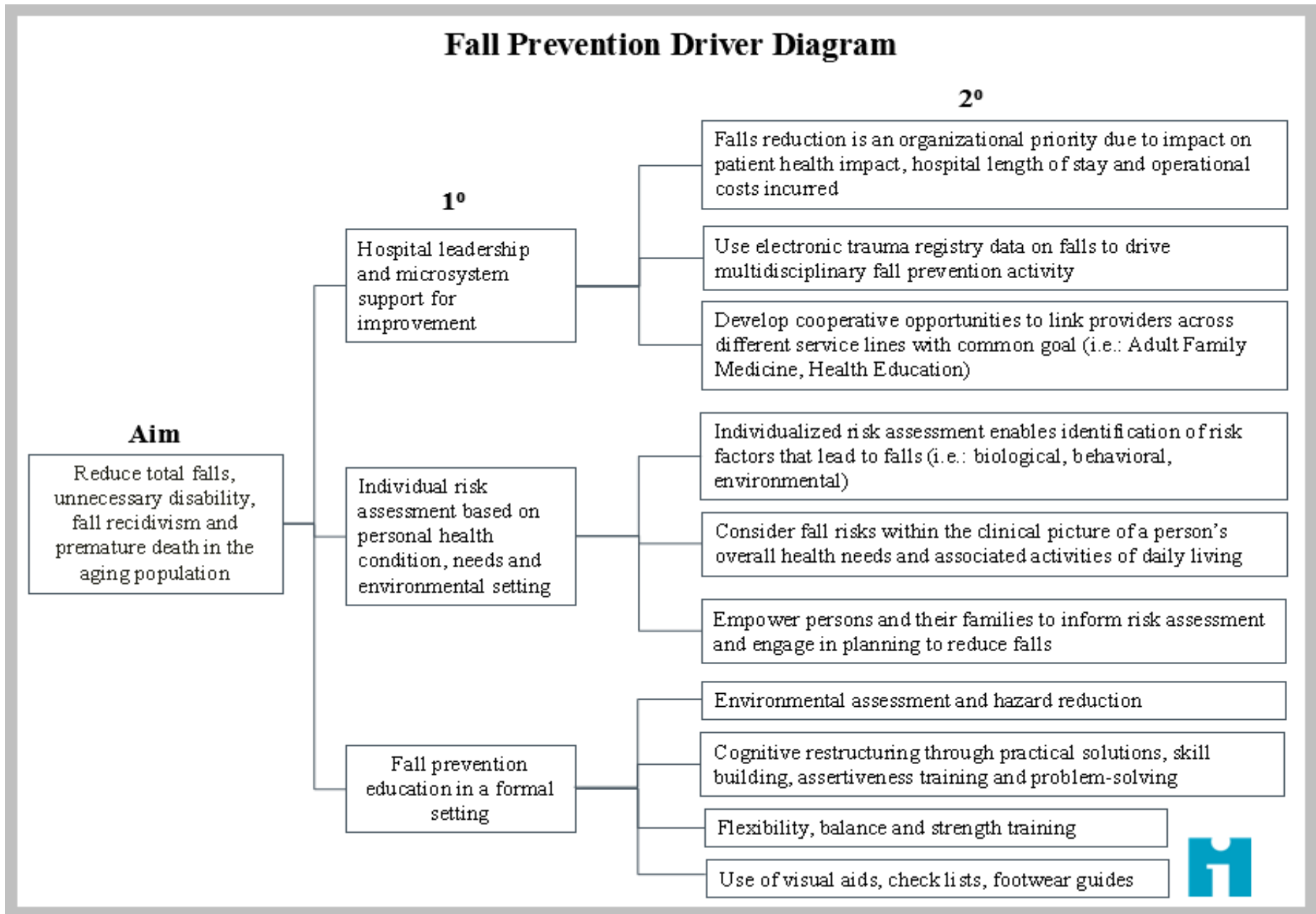
Data Definitions:

Data Element	Definition
PAR-Q	Physical Activity Readiness Questionnaire.
Fist Session Survey	Questions regarding falls management, exercise levels, and background information.
Last Session Survey	A repeat of the first session survey to compare and evaluate change.
Last Class Evaluation	Questions concerning fear of falling, changes made to participant's immediate environment, comfort in increasing activity levels, plans to increase activity levels, background information.
Fall Risk Factor	Something that increases a person's chance of falling. This may be a biological characteristic, a behavior, or an aspect of the environment.
Biological Fall Risk Factors	Muscle weakness or balance problems, medication side effects and/or interactions, chronic health conditions such as arthritis or stroke, vision changes, vision loss, loss of sensation in the feet.
Behavioral Fall Risk Factors	Inactivity, risky behaviors such as standing on a chair in place of a step stool, alcohol use.
Environmental Risk Factors	Clutter and tripping hazards such as poor lighting, lack of stair railings, lack of grab bars inside bathtubs and showers, poorly designed public spaces.
Fidelity	Fidelity describes the extent to which a program is delivered consistently by all trainers across sites and delivered according to the program developers' intended curriculum design and protocols.
Master Trainer	Recruits and trains Coaches to lead *A Matter of Balance* (AMOB) in-person classes, or via internet-based learning platforms (AMOB-V). MT's can run classes independently, coordinate the program in the local community, market the program to older adults, and evaluate fall prevention outcomes.

Measure Descriptions:

The outcome measure for this improvement project will be the number of persons aged 60 years and older who are enrolled into AMOB after being screened and referred by AFMP's. The data source will be a web-based registration platform, and the target for the outcome measure is a 10 times increase from the current baseline of zero.

Process measures that describe how the fall prevention program benefits the participants includes self-reported or observed improvement in the participant's health status or functional ability. Data sources will include; (1) the Physical Activity Readiness Questionnaire (PAR-Q), (2) an initial session survey with questions regarding falls prevention, physical activity levels, and background information, (3) a last session survey to compare evaluative change, (4) a last class evaluation with questions concerning comfort in talking about fear of falling, changes made to their immediate environment, comfort in increasing activity levels, plans to increase activity levels, background information, and (5) the capture, evaluation and interpretation of trauma activation types in the Trauma One Registry, an electronic data management system.

Fall Prevention Driver Diagram

2⁰

1⁰

Aim

Reduce total falls, unnecessary disability, fall recidivism and premature death in the aging population

Hospital leadership and microsystem support for improvement

- Falls reduction is an organizational priority due to impact on patient health impact, hospital length of stay and operational costs incurred
- Use electronic trauma registry data on falls to drive multidisciplinary fall prevention activity
- Develop cooperative opportunities to link providers across different service lines with common goal (i.e.: Adult Family Medicine, Health Education)

Individual risk assessment based on personal health condition, needs and environmental setting

- Individualized risk assessment enables identification of risk factors that lead to falls (i.e.: biological, behavioral, environmental)
- Consider fall risks within the clinical picture of a person's overall health needs and associated activities of daily living
- Empower persons and their families to inform risk assessment and engage in planning to reduce falls

Fall prevention education in a formal setting

- Environmental assessment and hazard reduction
- Cognitive restructuring through practical solutions, skill building, assertiveness training and problem-solving
- Flexibility, balance and strength training
- Use of visual aids, checklists, footwear guides

Changes to Test

A cooperative agreement with hospital-associated adult family medicine physicians who treat

older adults in an outpatient setting will perform a multidimensional fall risk screening, then

refer at-risk persons for enrollment into the AMOB fall prevention program. The AMOB fall

prevention program has been selected for this project as it acknowledges the omnipresent risk of

falling yet emphasizes practical coping strategies to reduce this fear.
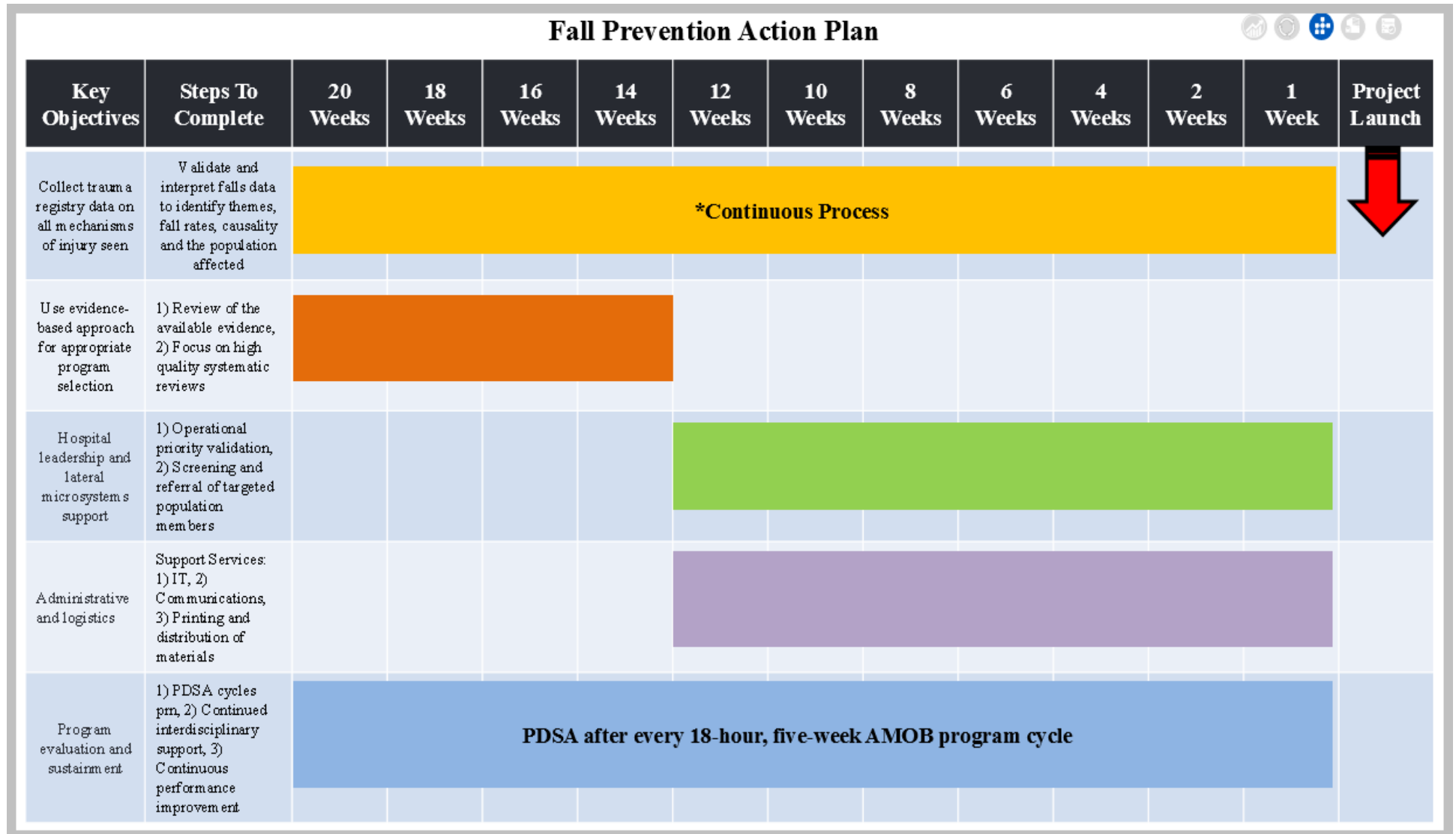
Changes to test include; (1) participant understanding that falls and the fear of falling are

controllable, (2) the setting of realistic goals for increasing physical activity, (3) the modification

of hazards in the participant's environment to reduce fall risk factors, and (4) understanding how

exercise can increase strength and balance.

Essential program components and activities that validate the changes to test include; (1) group

discussion, (2) problem-solving, (3) skill-building, (4) assertiveness training, (5) exercise

training, (6) sharing practical solutions, and (7) cognitive restructuring—learning to shift from

negative to positive thinking patterns.

The length/timeframe of the program is 18 hours (divided into nine virtual sessions) over five

weeks, with a 12-person participant maximum.

Project Timeline

Fall Prevention Action Plan

Key Objectives	Steps To Complete	20 Weeks	18 Weeks	16 Weeks	14 Weeks	12 Weeks	10 Weeks	8 Weeks	6 Weeks	4 Weeks	2 Weeks	1 Week	Project Launch
Collect trauma registry data on all mechanisms of injury seen	Validate and interpret falls data to identify themes, fall rates, causality and the population affected	*Continuous Process											
Use evidence-based approach for appropriate program selection	1) Review of the available evidence, 2) Focus on high quality systematic reviews												
Hospital leadership and lateral microsystems support	1) Operational priority validation, 2) Screening and referral of targeted population members												
Administrative and logistics	Support Services: 1) IT, 2) Communications, 3) Printing and distribution of materials												
Program evaluation and sustainment	1) PDSA cycles prn, 2) Continued interdisciplinary support, 3) Continuous performance improvement	PDSA after every 18-hour, five-week AMOB program cycle											

CNL Competencies

An emerging Clinical Nurse Leader (CNL) can add value to their practice by developing cooperative opportunities that link providers across different service lines with common goals, because it enhances patient safety by reducing real or potential harm, and improves patient outcomes (American Association of Colleges of Nursing, 2013). Since most quality initiatives are looking to prevent or fix a problem, a CNL needs to be an early adopter of change and use improvement science theory to lead departmental staff engagement, whether through clinical-based content or a community-based focus. This approach of integrating theory and interprofessional perspectives to improve practice and outcomes for patients is a complimentary version of translating and integrating scholarship into practice, a core CNL competency (American Association of Colleges of Nursing, 2013, p. 13).

Additionally, the role of a risk anticipator, one who can critically evaluate and anticipate risks to community-based older adults, through the lens of an injury prevention nursing professional (IPNP), is a critical component of the CNL core competencies (American Association of Colleges of Nursing, 2013, p. 36). The other dominant CNL role is that of educator, preparing individuals, families, and cohorts of clients for self-care and a maximal level of functioning and wellness (American Association of Colleges of Nursing, 2013, p. 37). Both CNL roles will be crucial to the IPNP's fall prevention improvement project.

Measures:

Measure	Data Source	Target
Process		
Self-reported or observed improvement in participants health status, fall-related confidence, or functional ability.	Qualitative data (session surveys and evaluations)	50%
Outcome		
% persons aged 60 years and older screened and referred by adult family medicine physicians.	Quantitative data- use of a web-based registration platform.	10x increase from baseline of zero
Balancing		
% health plan members aged 60 years and older in the service area that have had an eye exam in the last two years.	Slicer Dicer, a built-in EHR tool to explore patient denominators based on criteria specified by users such as counting patients fitting a specific condition.	40%
Fidelity to the program curriculum.	Sponsor spot checks and report outs by program master trainer.	100%

Team Members:

Project Lead	E.E.
Trauma Program Director	A.B.
Trauma Registrars	K.V., A.C.
Adult Family Medicine Chief Physician	O.G.
Trauma Department Office Coordinator	A.I.

Appendix I

Physical Activity Readiness Questionnaire (PAR-Q)

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE (PAR-Q AND YOU)
(*This is a self-evaluation. Please keep for your records.*)

Introduction: Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming more physically active. If you are planning to become much more physically active than you are now, start by answering the seven questions below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not accustomed to being very active, check with your doctor.

Directions: Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly, check YES or NO.

YES   NO

____ ____   1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?

____ ____   2. Do you feel pain in your chest when you do physical activity?

____ ____   3. In the past month, have you had chest pain when you were not doing physical activity?

____ ____   4. Do you lose your balance because of dizziness or do you ever lose consciousness?

____ ____   5. Do you have a bone or joint problem that could be made worse by a change in your physical activity?

____ ____   6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?

____ ____   7. Do you know of any other reason why you should not do physical activity?

If you answered YES to one or more questions - Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.
- You may be able to do any activity you want - as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those that are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

If you answered NO to all PAR-Q questions, you can be reasonably sure that you can:
- Start becoming much more physically active-begin slowly and build up gradually. This is the safest and easiest way to go.
- Take part in a fitness appraisal-this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively.

Delay becoming much more active:
- If you are not feeling well because of a temporary illness such as a cold or a fever-wait until you feel better.

Please note: If your health changes so that you then answer YES to any of the questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Source: Maine Department of Health and Human Services, 2021

Appendix J

First Session Survey

A MATTER OF BALANCE — First Session Survey
MANAGING CONCERNS ABOUT FALLS

Today's Date: ☐☐ / ☐☐ / ☐☐☐☐ (Month / Day / Year)

Your Name: ☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐ (First / Last)

The following questions will provide us with background information.

1. What is your date of birth? ☐☐ / ☐☐ / ☐☐☐☐ (Month / Day / Year)

2. What is your zip code? ☐☐☐☐☐

3. Today, how many people live in your household (including yourself)? ☐

4. Are you: ○ Female   ○ Male ?

5. Are you of Hispanic, Latino, or Spanish origin?
   ○ Yes
   ○ No
   ○ Unknown

6. What is your race? (Mark all that apply.)
   ○ American Indian or Alaska Native
   ○ Asian or Asian-American
   ○ Black or African-American
   ○ Hawaiian Native or Pacific Islander
   ○ White or Caucasian
   ○ Other _____

Please turn this paper over and fill out the other side.

First Session Survey (continued)

Please mark the circle that tells us how sure you are that you can do the following activities.

How sure are you that:	Very sure	Sure	Somewhat sure	Not at all sure
1. I can find a way to get up if I fall	○	○	○	○
2. I can find a way to reduce falls	○	○	○	○
3. I can protect myself if I fall	○	○	○	○
4. I can increase my physical strength	○	○	○	○
5. I can become more steady on my feet	○	○	○	○

During the last 4 weeks, to what extent has your concern about falling interfered with your normal social activities with family, friends, neighbors or groups?

○ Extremely   ○ Quite a bit   ○ Moderately   ○ Slightly   ○ Not at all

Mark ONLY ONE CIRCLE to tell us how much you are walking or exercising now.

○ I do not exercise or walk regularly now, and I do not intend to start.
○ I do not exercise or walk regularly, but I have been thinking of starting.
○ I am trying to start to exercise or walk.
○ I have exercised or walked infrequently for over a month.
○ I am doing moderate exercise less than 3 times per week.
○ I have been doing moderate exercise 3 or more times per week.

Source: Maine Department of Health and Human Services, 2021

Appendix K

Last Session Survey

A MATTER OF BALANCE — Last Session Survey
MANAGING CONCERNS ABOUT FALLS

Today's Date: Month / Day / Year

Your Name: First Last

Please mark the circle that tells us how sure you are that you can do the following activities.

How sure are you that:	Very sure	Sure	Somewhat sure	Not at all sure
1. I can find a way to get up if I fall	O	O	O	O
2. I can find a way to reduce falls	O	O	O	O
3. I can protect myself if I fall	O	O	O	O
4. I can increase my physical strength	O	O	O	O
5. I can become more steady on my feet	O	O	O	O

During the last 4 weeks, to what extent has your concern about falling interfered with your normal social activities with family, friends, neighbors or groups?

O Extremely   O Quite a bit   O Moderately   O Slightly   O Not at all

Mark ONLY ONE CIRCLE to tell us how much you are walking or exercising now.

O I do not exercise or walk regularly now, and I do not intend to start.
O I do not exercise or walk regularly, but I have been thinking of starting.
O I am trying to start to exercise or walk.
O I have exercised or walked infrequently for over a month.
O I am doing moderate exercise less than 3 times per week.
O I have been doing moderate exercise 3 or more times per week.

Source: Maine Department of Health and Human Services, 2021

Appendix L

Program Evaluation

A MATTER OF BALANCE — Class Evaluation

MANAGING CONCERNS ABOUT FALLS

Today's Date: Month [ ] / Day [ ] / Year [ ]

Thank you for participating in *A Matter of Balance*. To help us further meet the needs of others throughout the community, please take a few minutes to complete this evaluation form. We appreciate your feedback.

Please tell us your thoughts about the *A Matter of Balance* class. Mark the answers that apply on the front and back of this page.

1. The leaders were well prepared.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

2. The classes were well organized.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

3. The participant workbook helped me better understand the classes.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

4. As a result of this class, I feel more comfortable talking with others about my fear of falling.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

5. As a result of this class, I have made changes to my environment.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

6. As a result of this class, I feel more comfortable increasing my activity.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

Please turn this paper over and fill out the other side.

A Matter of Balance Class Evaluation (continued)

7. As a result of this class, I plan to continue exercising.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

8. I would recommend this class to a friend or relative.
   O Strongly agree   O Agree   O Disagree   O Strongly disagree

9. Are you: O Male   O Female ?

10. How old are you?
   O Less than 60 years   O 75-79 years
   O 60-64 years   O 80-84 years
   O 65-69 years   O 85-89 years
   O 70-74 years   O 90 years or older

What other changes have you made as a result of this class?

[   ]

Other comments or suggestions?

[   ]

Source: Maine Department of Health and Human Services, 2021

Appendix M

TraumaOne

The Most Powerful and Flexible Trauma Registry Solution

No matter what your institution's size…whether you are a small Level III trauma facility or a large government agency, Trauma One 4.2 is the Trauma Registry Solution that has the power and flexibility that you need to easily collect and analyze your trauma related data.

Key features:

- Fast and easy implementation
- Free data conversion from existing system
- Support for level I, II, III and IV trauma center requirements
- Suitable for single facility, county-wide or state-wide implementation
- Easily submit data to NTDB and any other mandated registries
- Automated ICD-10-CM coding, AIS-90 scoring and injury severity scoring
- An exhaustive list of included standard reports
- Real-time CQI audits
- Extensive security controls
- Easily interfaces with existing systems
- Easy to use, customizable data analysis and reporting
- Total customizability. Design screens to look like your existing screens or forms.
- Easily integrated into current workflow processes.
- Supports the latest hardware and technology including WiFi and Tablet PCs
- Securely stores data in either a Microsoft SQL Server or Oracle Database
- Zero footprint
- Web based

Source: Lancet Technology, 2019

Appendix N

Statement of Determination

Title of Project: Community-dwelling older adult fall prevention

Brief Description of Project:

This will be a community-based injury prevention project intended to address the most common mechanism of injury seen at a Northern California Level II trauma center, falls in community-dwelling adults aged 60 years and older.

A) Aim Statement: Global Aim: To reduce total falls, unnecessary disability, fall recidivism and premature death in the aging population. Specific Aim: To improve the screening, referral and enrollment of community-dwelling adults aged 60 years and older who are at risk for falls into an evidence-based fall prevention program from a baseline of zero persons per month to 10 persons per month by August 2021.

B) Description of Intervention: Targeted screening and referral by Adult Family Medicine (AFM) Physicians to the Department of Trauma's injury prevention program for enrollment into an evidence-based fall prevention program called *A Matter of Balance* (AMOB). Upon fall prevention program completion participants will; (1) self-report viewing falls and the fear of falling as controllable, (2) set realistic goals for increasing physical activity, (3) modify the participant's environmental and home hazards to reduce fall risk factors, (4) increase strength and balance through exercise, and (5) reduce the participants risk for falling.

C) How will this intervention change practice? Implementation of AMOB in the 140-bed, Northern California Level II trauma center's geographic area of responsibility will address fall risk factors, perform multidimensional assessments, and provide target interventions to older, community-dwelling adults. Fidelity will be ensured by way of Master Trainer report outs to organizational injury prevention sponsors. When medical centers provide targeted outreach and screening for unmanaged health risks such as falls, they reduce unnecessary disability and premature death in the local population, a key driver to achieving health equity in the community they serve (Kaiser Permanente Northern California Region Community Health, 2020). When trauma centers utilize effective fall prevention interventions, they reduce total falls in the community setting and reduce fall recidivism, victims who experience fall-related injuries and return within one year for a subsequent fall-related injury, by 18-22% (Howland et al., 2015, p. 4).

D) Outcome measurements:

Measure	Data Source	Target
Process		
Self-reported or observed improvement in participants health status, fall-related confidence, or functional ability.	Qualitative data (session surveys and evaluations).	50%
Outcome		
% persons aged 60 years and older screened and referred by adult family medicine physicians.	Quantitative data- use of a web-based registration platform.	10x increase from baseline of zero
Balancing		
% health plan members aged 60 years and older in the service area that have had an eye exam in the last two years.	Slicer Dicer, a built-in EHR tool to explore patient denominators based on criteria specified by users such as counting patients fitting a specific condition.	40%
Fidelity to the program curriculum.	Sponsor spot checks and report outs by the program Master Trainer	100%

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used: (http://answers.hhs.gov/ohrp/categories/1569)

⊗ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

<div align="center">EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *</div>

Instructions: Answer YES or NO to each of the following statements:

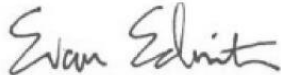| Project Title:	YES	NO
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	YES	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	YES	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	YES	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	YES	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	YES	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	YES	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	YES	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	YES	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	YES	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME (Please print):

Evan Edminster

Signature of Student:

Evan Edminster

DATE: April 1, 2021

SUPERVISING FACULTY MEMBER NAME (Please print):

Liesel Buchner

Signature of Supervising Faculty Member

Liesel Buchner

DATE: 8/2/2021