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Fall Prevention among Older Adults Living in the Community

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Fall Prevention among Older Adults Living in the Community

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Dedication

This original work is dedicated to my husband, Dr. Amol Karmarkar, to our children, Aarya Karmarkar and Parth Karmarkar, and to my mother, Dr. Kranti Kulkarni.

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Fall Prevention among Older Adults Living in the Community

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Abstract:

Increasing awareness of falls and fall hazards can improve health outcomes reducing falls and fall injuries. From a public health perspective, reducing falls translates into improved health-related quality of life and decreased health care spending. To ensure this increased awareness, separate fall prevention training seminars were developed for older adults living in the community (individual-level training seminar) and for their providers (provider-level training seminar) in a small and diverse county in Texas (Galveston). The seminars were developed using evidence-based fall prevention resources such as the Centers for Disease Control and Prevention (CDC). Each type of training seminar included a presentation and review and dissemination of resources. Audience feedback in the evaluation forms revealed that the audience found the information to be beneficial, insightful and counter-intuitive given their misconceptions regarding falls. Each audience reported that they felt inspired and empowered to take definitive action for reducing their own/their clients' fall risk.

TABLE OF CONTENTS

List of Tables	xi
List of Figures.....	xii
List of Abbreviations	xiii
CHAPTER 1	1
Introduction.....	1
<i>Trends in fall-related injuries.....</i>	<i>2</i>
<i>Differences in Fall Rates among older adults by health status socio-demographic characteristics</i>	<i>3</i>
Differences by health status	3
Differences by age	4
Differences by gender	4
Differences by race/ethnicity	4
Differences by State	5
<i>Burden of falls occurring among older adults: Mortality</i>	<i>6</i>
Deaths among Older Adults due to Unintentional Falls	6
Trends in Rates of Deaths from Unintentional Falls among older adults ...	7
Differences in Death Rates due to Falls by age	8
Differences in rates of death due to unintentional falls by state.....	9
<i>Burden of falls occurring among older adults: Non-fatal injuries and their outcomes</i>	<i>10</i>
<i>Burden of falls occurring among older adults: Fear of Falling.....</i>	<i>10</i>
<i>Burden of falls occurring among older adults: Costs</i>	<i>11</i>
<i>Causes of Falls: Fall risk factors for Older adults</i>	<i>11</i>
Individual-level/Intrinsic– Biological Risk Factors	12
Individual-level/Intrinsic– Behavioral and Psychological Risk Factors	13
Extrinsic/Environmental Risk Factors	13
<i>Addressing Modifiable Fall Risk factors for Fall Prevention among Older Adults</i>	<i>13</i>
CHAPTER 2	16
Methods.....	16
<i>Objectives of Current Capstone Project.....</i>	<i>16</i>
<i>Target Population for Current Capstone Project.....</i>	<i>17</i>
<i>Individual-level Training Seminars.....</i>	<i>18</i>

<i>Provider-level Training Seminars</i>	21
Examples presented during the Provider-level Training Seminar.....	26
<i>Audience Feedback</i>	27
<i>Summary of Methods for the Current Capstone Project</i>	31
CHAPTER 3	34
Results	34
<i>Results accomplished through this capstone project</i>	34
Individual-level Training Seminars.....	34
Provider-level Training Seminar	34
<i>Summary of Information Gathered from Individual-level Training Seminars and the Provider-level Training Seminar</i>	36
CHAPTER 4	41
Discussion and Future Research Directions	41
<i>Value of this capstone project</i>	41
Success Stories of implementing STEADI toolkit	43
<i>Limitations</i>	45
Limitations pertaining to the Individual-level Training Seminars	45
Limitations pertaining to the Provider-level Training Seminar.....	46
<i>Future Research Directions</i>	47
CHAPTER 5	50
Conclusion	50
APPENDIX 1	55
Chart for Hospital Discharges during 2014 with the Clinical Classification code: Fall, by age group	55
APPENDIX 2	56
Hand-out: Houston-Galveston Area Agency on Aging	56
APPENDIX 3	58
Image of Hand-Out: Rebuilding Together	58
APPENDIX 4	59
Images of Hand-out: Check for Safety Brochure	59
APPENDIX 5	68
Algorithm for fall risk assessment and intervention	68
APPENDIX 6	69
Check Your Risk of Falling	69
APPENDIX 7	70

'Talking About Fall Prevention with Your Patients'	70
APPENDIX 8	72
Fall risk checklist.....	72
APPENDIX 9	73
Integrating Fall Prevention into Practice	73
APPENDIX 10	74
Preventing Falls in Older Adults' Tri-fold Provider Pocket Guide.....	74
APPENDIX 11	77
Screen shot of one of the STEADI toolkit for providers Webpages: Functional Assessments	77
APPENDIX 12	78
Flyers displayed at OLLI informing members of upcoming training seminars.....	78
APPENDIX 13	79
Course Description for the Free-of-Cost	79
Fall Prevention Training Seminars (for Older Adults)	79
offered at the Osher Lifelong Learning Institute during Fall 2015.....	79
REFERENCES	80
VITA	84

List of Tables

Table 1:	Verbatim description of information obtained through the evaluation forms completed by the attendees of the individual-level training seminars.....	36
Table 2:	Verbatim description of information obtained through the evaluation forms completed by the attendees of the provider-level training seminars.....	37

List of Figures

Figure 1	Percentages of falls and fall injuries that occurred during the preceding year, as reported by older adults (age 65+ years) in the BRFSS 2014 data.....	5
Figure 2	Percent distribution of injury deaths by intent and cause among adults age 65 years and older in the United States: 2012-2013.....	6
Figure 3	Death rates as a result of Unintentional Falls	7
Figure 4	Age-adjusted Death rates by cause of death among adults age 65 years and older in the US, 2000 – 2013.....	8
Figure 5	Death rates by age group and cause of death among adults age 65 years and older in the US, 2000 – 2013.....	8
Figure 6	Texas: County-Level: Death rates: Unintentional Falls: All races, ethnicities, both sexes, ages 65 and older, per 100,000 population: 2004-2010.....	17
Figure 7	Example of the Evaluation Forms completed by the Providers following the Provider-Level Training Seminar	27
Figure 8	Example of the Evaluation Forms completed by the Older Adults following the Individual-Level Training Seminar.....	29

List of Abbreviations

AHRQ	Agency for Healthcare Research and Quality
BRFSS	Behavioral Risk Factor Surveillance System Survey
CDC	Centers for Disease Control and Prevention
GACN	Galveston Aging Care Network
HCUP	Healthcare Cost and Utilization Project
ICD-9-CM	The International Classification of Diseases, 9th Revision, Clinical Modification
MMWR	Morbidity and Mortality Weekly report
OLLI	Osher Lifelong Learning Institute
STEADI	Stopping Elderly Accidents Deaths and Injuries
US	United States
UTMB	University of Texas Medical Branch, Galveston, Texas
VA	Veterans Affairs
WISQARS	Web-based Injury Statistics Query and Reporting System

CHAPTER 1

Introduction

This capstone project involved providing informational training seminars. The purpose of developing and delivering these training seminars was to contribute towards improving the health of the older adults living in the community, by means of providing health education. This goal was categorized into two clearly defined objectives. The first objective was to increase knowledge and self-awareness about falls and fall risk factors as they applied to each individual among the community-dwelling older adults, who were also members of the Osher Lifelong Learning Institute, Galveston, Texas (OLLI at UTMB Health). And the second objective, was to promote the health of these older adults by encouraging their healthcare and other non-medical service providers to conduct fall risk assessments and interventions on a routine basis. For this purpose, the providers were made aware about the comprehensive fall-risk assessment and intervention tool-kit namely the 'Stopping Elderly Accidents Deaths and Injuries (STEADI) toolkit for providers' developed by the Centers for Disease Control and Prevention (CDC).

One of the most common causes of injuries – both non-fatal and fatal – among adults aged 65 years and older is a fall¹. One out of every three older adults experiences a fall at least once in his or her lifetime. Older adults who have experienced a fall once are two times as likely to experience a recurrent fall ². This chapter serves to provide the background and significance for conducting

the current capstone project that addressed modifiable fall risk factors among older adults living in the community in the form of educational seminars. Falls epidemiology has been discussed in detail, including: trends over time related to injuries from falls among older adults; differences in fall rates among older adults by health status and socio-demographic characteristics; the burden of fatal and non-fatal falls on the individual as well as on the nation's economy; and various types of fall risk factors.

Trends in fall-related injuries

To show trends in fall-related injuries, the Healthcare Cost and Utilization Project (HCUP) was utilized. This is an online resource, by the Agency for Healthcare Research and Quality (AHRQ) for all hospital data, all conditions and procedures, and all payer types. Thus, this is a useful data source for obtaining trends data in acute hospital admissions over time. In addition, this website (<https://www.hcup-us.ahrq.gov>) provides an online portal from which information on trends can be customized based on specific classification or system codes such as the ICD-9 codes (The International Classification of Diseases, 9th Revision, Clinical Modification: ICD-9-CM), and clinical classification codes.

Based on the Hospital Inpatient National Statistics for the year 2014, individuals age 65 and older formed the greatest proportions of all individuals discharged with clinical classification code of a 'fall': with nearly 43% being adults age 65 to 84 years of age, and nearly 27.5% being those who were 85+ years of age (Appendix 1).

The number of fall-related injuries that older adults are experiencing have been rising over the years³. In the year 2013, 2.5 million older adults were brought to the emergency departments across the United States for fall-related injuries³. Among these, more than 740,000 were admitted to the hospital for serious injuries including hip fracture, other major fractures and/or head trauma³. These numbers rose to 2.8 million and 800,000 respectively, for the year 2014. Based on the Behavioral Risk Factor Surveillance System Survey (BRFSS) data for 2014, 28.7% of older adults had fallen at least once in the preceding year¹. The Morbidity and Mortality Weekly report (MMWR) converted this proportion to an estimated 29 million falls¹.

Differences in Fall Rates among older adults by health status socio-demographic characteristics

These differences described below are based on the information obtained from the MMWR on Falls and Fall Injuries among older adults, 2014¹. This report summarizes the analyses of the Behavioral Risk Factor Surveillance System (BRFSS) 2014 data. The report states however that since the BRFSS is self-reported data and is subject to reporting and recall biases, the age, gender and race/ethnicity differences may not exactly match the true differences¹.

Differences by health status

Fall-related injury rates were significantly higher among older adults who reported having poor health status (BRFSS administered question regarding health status, grading the individual's health status as either one of excellent, very good, good, fair, or poor). The rate of fall-related injuries among individuals

reporting poor health status was 480 per 1000, as opposed to 69 per 1000 among those who reported excellent health status.

Differences by age

The percentage of older adults who reported in 2014 of having fallen at least once in the past year, was the greatest among those aged 85 years and older: 36.5%, followed by those aged 75-84 years: 29.8%, and finally by those aged 65-74 years: 26.7%. The increase in percentage with older ages was also observed in the percentage of fall-related injuries reported: 13.5% among individuals aged 85 years and older as opposed to 11.4% among those aged 75 – 84 years, and 9.9% among those aged 65 – 74 years (significant difference in age groups: $p < 0.01$)¹.

Differences by gender

In 2004, more than 30% of women reported to have fallen, as opposed to 26.5% of men. This difference is statistically significant ($p < 0.01$). In addition, among those who reported falling, a greater percentage of women reported to have incurred a fall injury that needed medical attention (12.6%) as opposed to the proportion of their male counterparts (8.3%) ($p < 0.01$)¹.

Differences by race/ethnicity

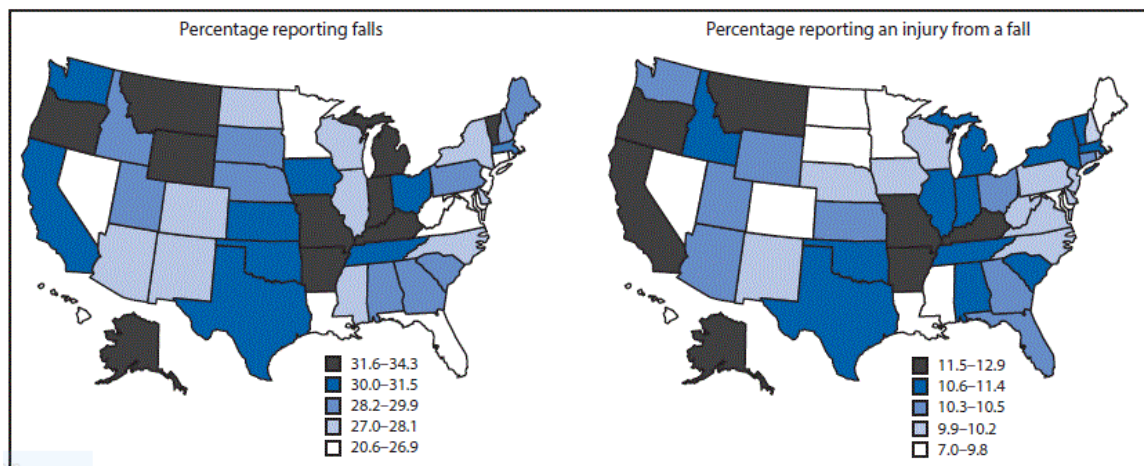
The highest percentage of older adults experiencing a fall was among American Indian or Alaskan Natives: 34.2%, followed by that among non-Hispanic Whites at 29.6%, Hispanics at 23.1%, and non-Hispanic Blacks at 26.4%. Differences also existed in the likelihood of reporting fall-related injuries

ranging from 16.8% among American Indian or Alaskan Natives, to 10.9% among whites, 10.7% among Hispanics, and 7.8% among Blacks¹.

Differences by State

The following figure (Figure 1) obtained from the MMWR Falls and Fall Injuries among older adults, 2014¹. As depicted in the figure, the states of Montana, Oregon, Alaska, Missouri, Arkansas and Kentucky were in the highest percentage range of reported falls and fall injuries in the nation. The state of Arkansas had the highest percentage of respondents reporting falls: 34.3%, and the state of Missouri had the highest percentage reporting injuries from falls: 12.9%.

Figure 1: Percentages of falls and fall injuries that occurred during the preceding year, as reported by older adults (age 65+ years) in the BRFSS 2014 data



* Injuries resulting from falls that caused respondents to limit their regular activities for ≥ 1 days or to go see a doctor.

Source webpage: <https://www.cdc.gov/mmwr/volumes/65/wr/mm6517a2.htm>
Date Retrieved: April 30, 2016

The above section described differences by age, gender, race/ethnicity, and state, in percentages of reported falls and fall injuries. The following two

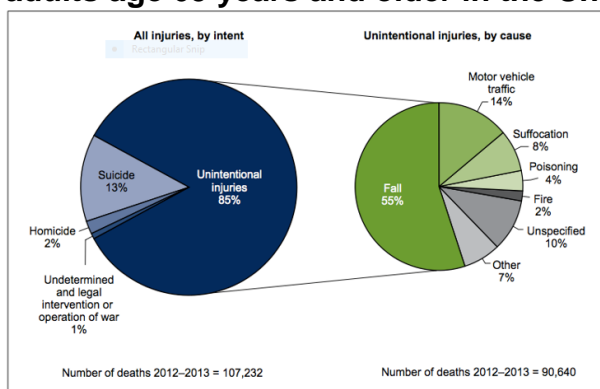
sections describe the burden of falls with respect to injuries and outcomes including but not limited to fatalities and costs incurred because of unintentional falls among older adults.

Burden of falls occurring among older adults: Mortality

Deaths among Older Adults due to Unintentional Falls

'Unintentional injuries' is the third leading cause of death among adults in the age group of 55 to 64 years, and it is the 7th leading cause among those age 65 years and older⁴. Additionally, as illustrated in Figure 2 below, more than half of these fatal unintentional injuries occur because of falls. Thus, falls become a major contributor to the cause of death in the age groups of 55 years and older. Figure 2, demonstrates the distribution of deaths from injuries based on intent and cause among older adults during 2012 and 2013. It is clearly depicted that 85% of deaths among older adults are as a result of unintentional injuries and more than half of these unintentional injuries are incurred as a result of a fall.

Figure 2: Percent distribution of injury deaths by intent and cause among adults age 65 years and older in the United States: 2012-2013



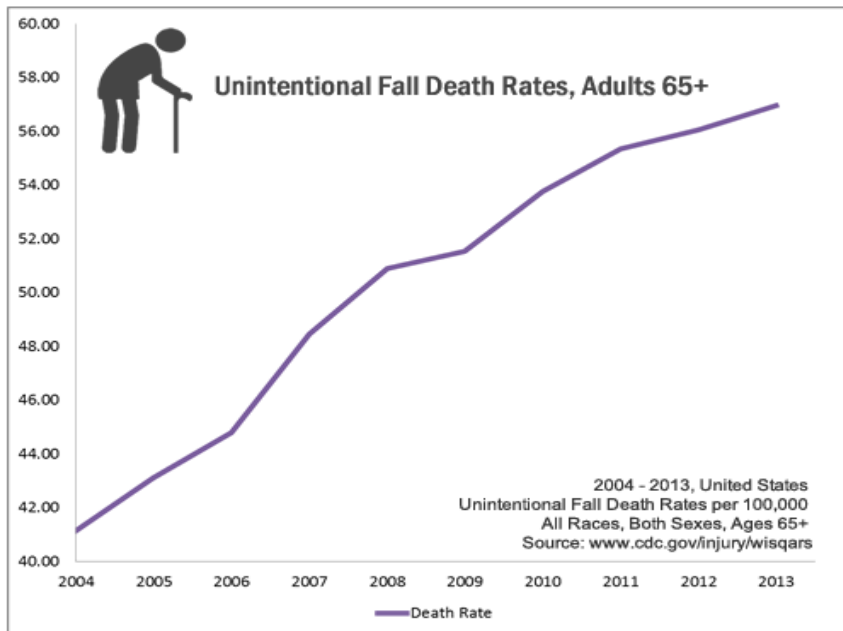
Note: Percents may not total 100% due to rounding
Source: CDC/NCHS National Vital Statistics System, Mortality.
Webpage: <https://www.cdc.gov/nchs/nvss/deaths.htm>
Date retrieved: January 6, 2016

The rate of deaths has risen to 25,500 deaths as a result of unintentional falls in adults aged 65 years and older, as of the year 2013³. This number is rising over time – in the year 2014, nearly 27,000 deaths among older adults occurred as a result of a fall¹.

Trends in Rates of Deaths from Unintentional Falls among older adults

Figure 3, below, depicts the sharp rise in death rates due to unintentional falls from 41 per 100,000 in 2004 to nearly 57 per 100,000 in 2013.

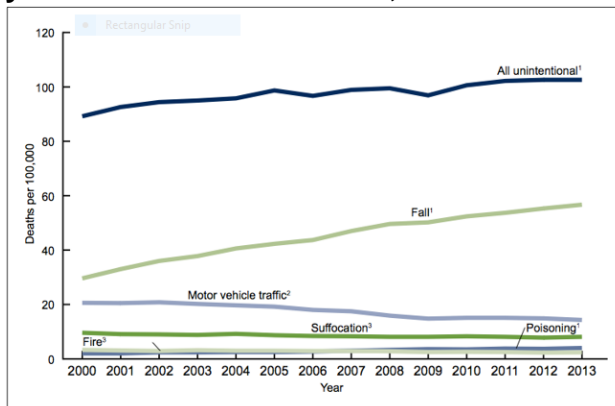
Figure 3: Death rates as a result of Unintentional Falls



Source: <http://www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html>
Date retrieved: July 25, 2015

Figure 4, below, compares the linear trends in death rates due to various unintentional causes among older adults. It is clear from this figure the highest increase in the rates of deaths over the period of 2000 to 2013 was because of unintentional falls.

Figure 4: Age-adjusted Death rates by cause of death among adults age 65 years and older in the US, 2000 – 2013



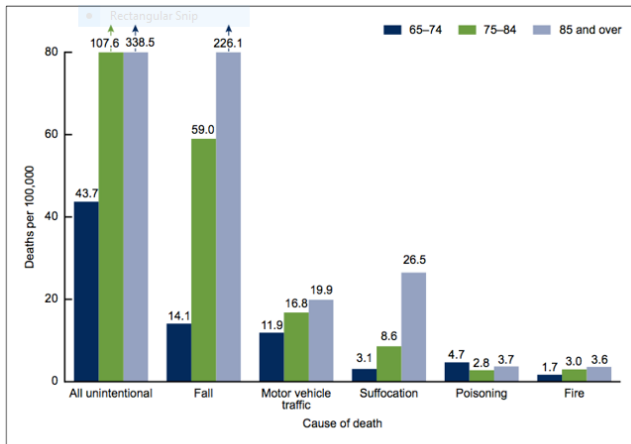
¹Significant positive linear trend ($p < 0.05$).
²Significant negative linear trend from 2000 to 2009 ($p < 0.05$).
³Significant negative linear trend ($p < 0.05$).
 SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Source webpage: https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_04.pdf
 Date retrieved: September 10, 2016

Differences in Death Rates due to Falls by age

During the years 2012 and 2013 the death rate due to falls among older adults age 85 years and above was higher than those aged 75 – 84 years and 65 – 74 years, by nearly 4 times and 16 times respectively. This has been demonstrated in Figure 5 below.

Figure 5: Death rates by age group and cause of death among adults age 65 years and older in the US, 2000 – 2013



NOTE: Death rates are significantly different for all age group comparisons for each cause of death.
SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Source webpage: https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_04.pdf

Date retrieved: September 10, 2016

Differences in rates of death due to unintentional falls by state

The differences in rates of death due to unintentional falls by state in the US, among adults age 65 years and older was obtained from the 'Fatal Injury Mapping' tool on the Web-based Injury Statistics Query and Reporting System (WISQARS) of the Centers for Disease Control and Prevention (CDC). These maps showed the range of number of deaths per 100,000 of the US population for each state for the two-year periods namely 2008 – 2010, 2010-2012, and 2012-2014.

Based on these maps, it is evident that the mortality burden of falls has increased gradually for the states of Oregon, Minnesota, South Dakota, Iowa, Wisconsin, Colorado, New Mexico, Vermont and Rhode Island (from 75.02-127.04 during 2008-2010 to 81.97-128.96 during 2012-2014) and more drastically for the states of New Hampshire, Oklahoma and Kansas (from 53.96-75.01 during 2008-2010 to 81.97-128.96 during 2012-2014). The states of Arizona and Idaho have demonstrated a reduction in death rates due

unintentional falls (from 75.73-120.97 during 2010-2012, to 60.13-81.96 during 2012-2014)⁵.

Burden of falls occurring among older adults: Non-fatal injuries and their outcomes

In 2014, there were approximately 7 million fall injuries among older adults that required medical treatment or limited the level of activity for at least 1 day¹. One out of every five falls causes serious injuries⁶. Nearly 95% of all hip fractures occur as a result of falling⁷. Falls are also the most common cause of traumatic brain injuries in older adults⁸. Longer hospital stays have been associated with poorer health outcomes. Older adults admitted to acute hospitals for fall injuries such as hip fracture have a longer hospital length of stay compared to those admitted for any other reason⁶. A fall can thus act as a beginning of cascading adverse health events and jeopardize the older adult's ability to return home and be able to live safely and independently in their home environment^{6,9}.

Burden of falls occurring among older adults: Fear of Falling

Older adults who have experienced a fall may not necessarily experience injuries, but they are very likely to develop a fear of falling¹⁰. Fear of falling is a very common psychological phenomenon among older adults after having fallen, and its inhibitory nature puts the individual at a greater risk of future falls¹⁰. This fear inhibits the older adults' participation in daily functional activities, especially physical activities and exercise. Limitation in physical activity leads to muscle weakness in the lower body from disuse atrophy of the skeletal musculature¹⁰.

Lower body weakness has been identified as one of the biggest risk factors for falls ¹⁰.

Burden of falls occurring among older adults: Costs

The costs associated with both fatal and non-fatal injuries from unintentional falls that required hospitalization, among adults age 65 years and older were also obtained from the 'Fatal Injury Data' tool on the Web-based Injury Statistics Query and Reporting System (WISQARS) of the Centers for Disease Control and Prevention (CDC). Based on this information for the most recent year available: 2010, the average work loss cost per individual for fatal injuries due to fall, among this population, was more than \$100,000; and the average medical cost per individual for hospitalization due to non-fatal injuries, was nearly \$40,000⁵.

Causes of Falls: Fall risk factors for Older adults

Falls occurring within and around the homes of older adults are the most common type of fall. The majority of the most serious fall injuries have occurred in and around the individuals' home¹¹. More than half of the older adults who experience a fall do not mention it to their doctor¹². This could be as a result of either a lack of awareness that a fall can be an indicator of decline in health status, or as result of vanity, or fear of stigma, or psychological denial¹².

Risk factors for falls in older adults have been clearly identified. Fall risk factors can be categorized as individual-level or intrinsic and environmental or extrinsic risk factors¹³. Individual-level factors can be further classified as biological and behavioral factors. Environmental fall risk factors are features of

the individual's environment, such as their home, that make it difficult for the individuals to negotiate through it safely (for example without tripping, slipping, stumbling, losing balance, etc.)¹³.

Most falls are caused by a combination of risk factors. The greater the number of risk factors, the higher is the individual's risk of falling¹⁴. Mere increase in age does not necessarily put an individual at an increased risk of falling. Also, falls can largely be prevented, given the fact that the factors that increase a person's risk can be reduced, corrected or eliminated as appropriate¹⁴. Below, the most important fall risk factors as identified through evidence-based research, are described¹⁴.

Individual-level/Intrinsic – Biological Risk Factors

These include advanced age, female gender¹⁵, lower body weakness, and associated impaired muscle coordination, endurance and flexibility, and impaired balance or gait¹⁶. Vitamin D deficiency, common among older adults can result in weakness of the large proximal muscle groups in the body such as those required for negotiating stairs or rising from a chair¹⁷. Prescription medicines such as those for anxiety, depression, and other tranquilizers, sedatives, as well as some non-prescription (over-the-counter) medicines such as those that may cause drowsiness, grogginess or clouding, or dizziness; can result in impaired balance and steadiness during standing, walking or negotiating stairs or turns¹⁸. Factors such as vision impairment¹³ and hearing loss¹⁹, and foot problems that cause pain during walking¹³, - all common among older adults, also increase their risk of falling.

Individual-level/Intrinsic – Behavioral and Psychological Risk Factors

Psychological factors such as anxiety, depression, and fear of falling can result in unhealthy behaviors such as sedentary lifestyle and self-imposed limitations on physical activity¹³. As mentioned earlier, restricted physical activity puts the individual at a greater risk of developing or worsening of balance impairment during standing and walking, and therefore at a greater risk of falling¹⁰. Cognitive impairment, delirium, can result in impulsivity and risky behaviors²⁰. An example of how cognitive impairment such as short term memory loss would increase the individual's risk of falling include forgetting to promptly clean up spilled food or grease on the floor that pose a fall hazard²⁰. An example of impulsive behavior increasing the individual's fall risk, would be rushing to get to and answer the front door when the door-bell rings²⁰.

Extrinsic/Environmental Risk Factors

Home hazards or dangers for falls within one's home environment include slippery, broken or uneven flooring or steps, throw rugs or clutter that can be tripped over, absence of sturdy handrails along stairs or grab-bars in the bathroom¹³.

Addressing Modifiable Fall Risk factors for Fall Prevention among Older Adults

Falls among older adults living in the community is a public health issue that needs to be addressed by means of effective community-based fall prevention interventions. Healthcare providers can help provide multi-factorial

interventions by tapping into existing community-based fall prevention programs and thus enabling a reduction in the individual's fall risk³.

Based on the data from the Behavioral Risk Factor Surveillance System (BRFSS), it is estimated that during the year 2014, 29 million falls occurred among adults age 65 years and older, of which 7 million resulted in injuries that limited regular activities for at least one day or caused the individual to go see their doctor¹. Thus, it is highly likely that a greater proportion out of these 7 million injuries never got reported to the healthcare provider. It is therefore evident that it is also incumbent upon the healthcare provider to enquire with their patients regarding any falls they may have experienced as much as it is upon the individual to report it.

Research has shown that the most effective fall risk reduction interventions are those that use multiple approaches (multifaceted interventions) with various service providers including the community programs and healthcare providers actively involved in delivering these interventions. Additionally, research has shown that interventions by a healthcare provider such as a physician, physician assistant, a nurse, nurse practitioner, occupational therapist, physical therapist, or a pharmacist, can reduce the individual's risk of fall by 24%²¹.

The Centers for Disease Control and Prevention (CDC), the National Center for Injury Prevention and Control, and the Division of Unintentional Injury Prevention have published the Compendium of Effective Fall Interventions: What Works for Community-Dwelling Older Adults, third edition ²². This is a compilation

of strong evidence-based research on various types of fall prevention interventions including exercise programs, home modifications, clinical intervention studies, as well as studies implementing multifaceted interventions. The above named organizations have also developed the “Preventing Falls: A Guide to Effective Community-based Fall Prevention Programs” which is a “how to” guide for community-based organizations for implementing their own evidence-based fall prevention programs ²³. The CDC have also developed the Stopping Elderly Accidents Deaths and Injuries (STEADI) toolkits for both the older adults as well as for the healthcare providers ²⁴. Information from all of these resources, as well as that from all the descriptive epidemiology covered earlier in this chapter, were utilized to develop fall prevention training seminars for older adults living in the community, and for their providers. This process has been described in details in the following (Methods) chapter.

CHAPTER 2

Methods

Objectives of Current Capstone Project

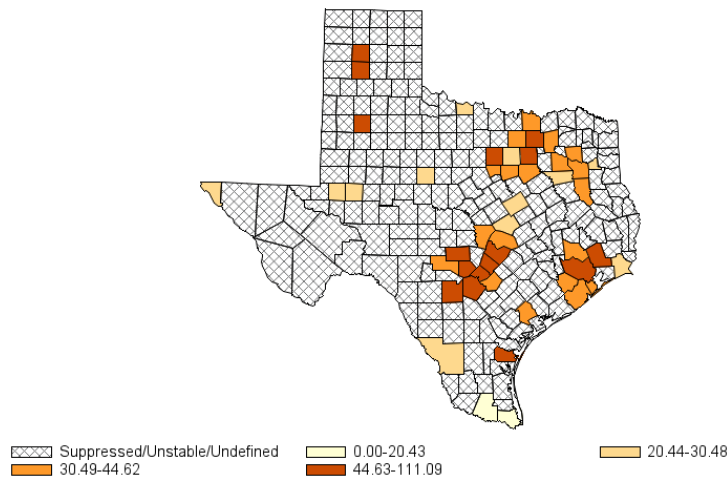
This capstone focused on delivering educational seminars with a goal of community health education and health promotion, and with two clearly defined objectives. The first objective was to increase awareness, about all the above-mentioned falls epidemiology and fall risk factors, among community-dwelling older adults attending the Osher Lifelong Learning Institute, Galveston, Texas (OLLI at UTMB Health). The second objective was to increase awareness among the healthcare and other non-medical service providers, who service these older adults, about the various components of the comprehensive fall-risk assessment and intervention tools in the STEADI toolkit that they can incorporate into their routine services.

To address these objectives, the first step was to compile educational materials that combined information from these STEADI toolkits for individuals and providers and all of the literature cited above. Second, training packages (deliverables including handouts, flyers and checklists) were developed and disseminated, and third, training seminars were delivered. Two types of training seminars were developed and delivered: education for older adults, and education for the healthcare providers. These training seminars were delivered at the Osher Lifelong Learning Institute, Galveston, Texas (OLLI at UTMB Health).

Target Population for Current Capstone Project

The members of OLLI are residents of communities of the greater Houston-Galveston area. The map depicting the rates of deaths due to unintentional falls by county in the state of Texas highlights the highest rates of falls in the respective counties of the greater Houston-Galveston area, namely Harris county and Galveston county, as shown in Figure 9 below. This figure shows that Houston and Galveston counties are areas with higher rates of deaths from falls. Therefore, this is a high-risk area that could potentially have great benefit from the goals of this project.

Figure 6: Texas County-Level Map: Death rates due to Unintentional Falls: All races, ethnicities, both sexes, ages 65 and older, per 100,000 population: 2004-2010



Source: This county map for the state of Texas was created from interactive portal: WISQARS.

Date created: January 9, 2016

Individual-level Training Seminars

For the older adult individuals attending the OLLI at UTMB, a ‘fall prevention’ training seminar was developed based on evidence-based fall prevention resources. The seminar included a presentation as well as a review and dissemination of resources. The resources included a home environment safety checklist and the contact information for local government and non-government agencies providing in-home services for preventing falls. Four sessions of the training, with a total of 25 attendees, were provided to the community-dwelling older adults of the Houston-Galveston area, at OLLI in September 2015.

The goal of these individual-level training seminars was to increase knowledge and awareness of the older adults living in the Galveston community

regarding falls, improved ability of self-identification of modifiable fall risk factors (such as fall hazards in their home environment), and knowledge of measures that they can take to address modifiable fall risk factors (such as consulting their doctor and seeking fall risk assessment and fall prevention interventions). Feedback on the trainings delivered was obtained in the form of anonymous evaluation forms that the attendees completed at the end of the session. The questions in the evaluation form sought to obtain the attendees' input on the quality and effectiveness of the training as well as on their recommendations for improvements for future training seminars.

The format of the individual-level training seminars was a 45-minute interactive power-point presentation, followed by 15 minutes of question-answer session. The 45-minute interactive power-point presentation included information on who is at risk, how big is the problem in the US and in Texas counties, what could happen after a fall, why is it important to reduce the risk of falls, what factors increase risk of falls, fear of falling, what can be done to reduce the risk of falls, who can help, and the next step.

One of the take-home messages of the presentation was that aging, in and of itself, may not necessarily increase their risk of falling. This was done by highlighting the "Debunking the Myths of Older Adults and Falls" by the National Council on Aging ²⁵. The discussion focused on the point that falls among older adults is a public health problem that can be greatly reduced by mitigating the fall risk factors.

The primary focus of the 15 minutes of question-answer session was to assist the individuals attending the training seminar with familiarizing themselves with the resources provided in the training package. The three handouts that comprised the resources included in the individual-level training package were: a. contact information of Houston-Galveston Area Agency on Aging that provide in-home services to older adults for fall-risk reduction (Appendix 2); b. the Rebuilding Together Affiliates (Appendix 3); and c. the “check for safety brochure” (Appendix 4). All questions that the attendees had related to contents of the presentation were addressed during this question-answer session.

The hand-out for the Houston-Galveston Area Agency on Aging (Appendix 2) highlighted all the pertinent contact information and the services provided in bold and large print letters. The 'Rebuilding Together' was a flyer providing contact information of the different national affiliates (across all the United States) of the organization names Rebuilding Together. This organization through its local affiliates provides 'handy-man' services for required home modifications for fall safety, providing subsidized as well as free-of-cost services for those in need (see Appendix 3 for image).

The Check for Safety brochure was the third hand-out provided as part of the individual-level training package. This resource was obtained from the STEADI toolkit for older adults on the CDC website. The STEADI toolkit for the older adults includes resources in the form of brochures and checklists. These resources not only increase the individual's knowledge about fall risk factors and

informs them whether they may be at risk; but also provides them with guidelines for step-wise measures they can take to reduce their fall risk ²⁴.

The Check for Safety brochure provided a summary of the information covered as part of the 45 minutes' interactive power-point presentation. The brochure also provided a checklist for the individuals to be able to conduct a self-assessment of their home environment, risk identification for all the fall risk factors that they learned about during the seminar, and easy solutions for eliminating or minimizing the effects of potential fall hazards in their environment.

Provider-level Training Seminars

For the healthcare and non-medical service providers serving the older adults in the Galveston community, a training seminar was delivered at the Galveston Aging Care Network Breakfast Talk, with a total of 20 attendees, at OLLI in January 2016. The providers were educated regarding burden of falls on the older adults, their families, and the overall healthcare system; modifiable fall risk factors; evidence-based multi-factorial fall prevention interventions; role of the provider in older adult fall prevention, as well as resources available for healthcare providers and their patients in the STEADI toolkits.

The goal of this training seminar was to encourage the healthcare providers and the non-medical service providers attending the seminar, to consider enhancing their practice norms by incorporating fall prevention assessments and interventions into their routine practice/services delivered. The provider-level training seminar was also in the form of 45 minutes of interactive power-point presentation, followed by 15 minutes of question-answer session.

The 45-minute interactive power-point presentation included information on 'burden and impact of falls on older adults and on the healthcare system', 'economic impact of falls', 'modifiable fall risk factors', 'implementing fall prevention in the community', 'clinical approach', 'assessment', 'CDC Project: the STEADI tool-kit for providers', 'STEADI webinar', and 'resources included in the STEADI tool-kit for providers'²⁶.

The STEADI toolkit was chosen as resource for developing and delivering the provider-level training seminar because it is the most comprehensive and all-inclusive tool that can be adopted, utilized, and implemented, by a range of provider disciplines. Presenting these pre-existing resources to the providers and introducing this rich resource to the providers was determined to be the most effective and time-efficient strategy for two reasons. First, the CDC has already invested several years in compiling all of the evidence base to create this user-friendly and all-inclusive tool for screening, assessment and offering interventions; and secondly, the purpose of the toolkit matches the goal of this project. This goal was to educate providers in identifying fall risk factors and implementing fall prevention as part of their routine services.

In addition, the STEADI toolkit developed for the healthcare providers is comprehensive and versatile with multiple forms of resources. These include online training for healthcare providers, webinars and instructional videos, as well downloadable resources such as one-pager checklists and pocket guides. The resources in the toolkit have been developed to enable the healthcare provider to systematically assess their patients' fall risk, educate their patients, select and

provide, and/or provide referral to, appropriate interventions, and provide follow-up²⁶.

During the 45-minute interactive power-point presentation, the American Geriatric Society's Clinical Practice Guideline: Prevention of Falls in Older Persons²⁷ that recommends all older individuals should be asked if they have experienced any previous falls, assessed for their risk of falls, and provided the necessary interventions, was highlighted.

Short video clips of the functional assessments that the providers can implement to assess their clients' risk of falling, namely the 30-second chair-stand test, the 4-stage balance test, and the timed up-and-go test²⁶, were also played during the seminar.

The six handouts that comprised the training package included resources from the STEADI toolkit for healthcare providers. The handouts were: Algorithm for fall risk assessment and intervention, "Check Your Risk of Falling", 'Talking About Fall Prevention with Your Patients' Fall Risk Checklist, 'Integrating Fall Prevention into Practice', and 'Preventing Falls in Older Adults' Provider Pocket Guide. The '*Algorithm for fall risk assessment and intervention*' (Appendix 5) is a screening and evaluation flow chart that enables providers to identify their individual client's level of fall risk: low, medium or high risk, as well as summarizes the appropriate interventions based on the level of risk²⁶.

The '*Check your risk of falling*' one-page checklist is a self-assessment tool to assess one's risk of falling (Appendix 6). This serves as an initial screening tool that the providers can use. The providers were informed about

assisting their clients complete this self-assessment tool with them. This checklist provides Yes/No response questions with an explanation of “why it matters” for each of the question. The checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates, and is a validated fall-risk self-assessment tool²⁸. Each question is assigned either a score of 1 or 2 points. If the sum of the score points for all questions adds up to a score of 4 points or more, then the individual may be at risk of falling^{26,28}.

The *‘Talking About Fall Prevention with Your Patients’* (Appendix 7) is a guide for the providers for starting and continuing conversations about fall prevention based on the ‘stages of change model’²⁹. It provides examples of conversations for each stage of change – what the provider may say based on what the patient says. Using this resource as a guide will enable the provider to match their advice about fall prevention to their patient’s stage of readiness. The provider’s goal is to move the client to the next stage of change. For example, in the first stage of change, namely the Precontemplation Stage, the individual/client doesn’t view himself or herself at risk of falling. In the second stage - Contemplation, they begin considering the possibility that they may be at risk of falling. In the third stage of change, the Preparation Stage, the client considers himself/herself to be at risk of falling and is thinking about doing something about it. In the fourth stage of change, the Action Stage, the client considers himself/herself to be at risk of falling and is ready to do something about it. And in the final, Maintenance Stage, the provider can encourage the

client to maintain newly adopted behaviors, that can reduce their fall risk, over time.

'Fall risk checklist' (Appendix 8) completed by the provider, is a summary of the evaluation of various fall risk factors. This checklist stays with the provider along with their patient's/client's records. *'Integrating Fall Prevention into Practice'* (Appendix 9) is a wall-chart for the providers to determine the level of experience and expertise needed for personnel within their practice who will be responsible for conducting the assessments for fall risk and for providing education and interventions to their older adult patients. The *'Preventing Falls in Older Adults' Tri-fold Provider Pocket Guide* (Appendix 10) summarizes all the key information including the fall risk assessment algorithm for the providers to keep at their finger-tips.

Appendix 11 is a snapshot of one of the webpages of the STEADI toolkit for providers. Two-minutes-long video clips from this webpage on how to implement the functional assessments for balance, leg strength and endurance, and mobility, when introducing all the STEADI toolkit resources for conducting fall risk assessments in the provider-level training seminar.

Thus, the STEADI tool-kit for providers was introduced in its entirety, including the screening tool, assessment tools, and recommended interventions. The primary focus of the 15 minutes of question-answer session was for assisting the providers attending the training seminar with familiarizing themselves with the resources/handouts provided in the training package and answering any questions they had about the resources or about the presentation.

Examples presented during the Provider-level Training Seminar of how some of the components of the STEADI toolkit may be utilized

After describing the above components of the STEADI toolkit for providers, the following examples were provided of how some of the above resources from the STEADI toolkit may be utilized.

For example, in a senior day program provider setting, delegated staff may conduct the initial screen for fall risk assessment, namely “check your risk for falling”, with the older adult individual. Such organizations have ongoing health and safety education programs in which an exercise program such as Yoga or Tai-Chi may be initiated to improve the balance and reduce the fall risk of those identified as potentially being at risk based on the above screening tool. Another example is seeking a healthcare consult to receive detailed and personalized multifactorial assessments.

In addition, a senior day program provider can educate the older adult individuals regarding information about interventions they can seek from their healthcare provider such as a medication review and Vitamin D and calcium supplementation, as well as other specialists’ referrals that they can obtain from their healthcare provider. Examples of such referrals include but are not limited to an orthotist, podiatrist for foot pain, and/or occupational therapist for functional assessments and home evaluations.

Finally, encouraging continued involvement in the community-based exercise program is important. The healthcare facility provider who will provide consult for fall risk assessment and intervention (e.g. outpatient primary care practice setting) can refer to the wall chart namely *‘Integrating Fall Prevention*

into Practice' and delegated physician assistant and/or nursing staff who conduct the functional assessments. The physician at this facility will utilize resources including the algorithm for identifying the level of fall risk that the individual is at, the fall risk checklist to document details of the multifaceted assessments, and the *'talking about fall prevention with your patients'* to help the patient to advance to the next stage of change and facilitate definitive action for changing behaviors as well as maintaining new behaviors over time.

Audience Feedback

Anonymous evaluation forms were voluntarily completed by all attendees at both the individual-level and provider-level training sessions. The feedback obtained was regarding the quality, clarity and relevance of content presented. Also, suggestions for improvement were sought.

Feedback on the provider-level training was also designed to better understand information about the provider's discipline, whether they found the information presented beneficial, and their willingness to incorporate the fall prevention interventions introduced into their routine practice/service delivery. Figures 7 and 8 illustrate examples of evaluation forms completed by the providers and the older adult individuals, respectively.

Figure 7: Example of the Evaluation Forms completed by the Providers following the Provider-Level Training Seminar

Osher Lifelong Learning Institute (OLLI) at UTMB Health
301 University Blvd, Galveston, TX 77555-0972—Located at 4700 Broadway, Suite B101

Fall Prevention in Older Adults – Role of the Healthcare Service Provider
Presenter: Kshitija ("Kay") Kulkarni

Please specify your discipline (circle bullets for all that apply):

- Physician (please specify specialty)
- Physician assistant
- Nurse practitioner
- Nurse
- Behavioral Psychologist/Therapist
- Physical therapist
- Occupational therapist
- Speech-language Pathologist
- Audiologist
- Ophthalmologist
- Optometrist
- Podiatrist
- Chiropractic doctor
- Alternative Medicine (such as Naturopathy, Ayurveda, Homeopathy) Specialist (please specify)
- Pharmacist/Pharmacologist (please specify)
- Dentist
- Nutritionist or Dietician/Dietary Expert
- Orthotist/Prosthetist
- Durable medical equipment specialist
- Case manager
- Social worker
- Community Liaison
- Home health service professional (please specify specialty/position name/role)
- Community service professional (please specify specialty/position name/role)
- Religious, spiritual or faith-based Organization personnel (please specify position name/role)
- Support Group personnel (please specify position name/role)
- Administrator or Manager (please specify type of facility administered or managed and position name/role)
- Other (please specify specialty/position name/role)

Please assess the overall quality and effectiveness of the presentation? **One is lowest rating. Ten is best.**

Lowest rating 1 2 3 4 5 6 7 8 9 10 Highest Rating

Why?

My nurses deal with falls in home on regular basis in home.

Please evaluate the effectiveness of the presenter? **One is lowest rating. Ten is best.**

Lowest rating 1 2 3 4 5 6 7 8 9 10 Highest Rating

Why?

Engaging, sharing and gave great info.

Was the information provided in the presentation useful for the services you provide to older adults who may be at risk of falling? (circle one bullet: yes or no)

- ☒ Yes
☐ No

Why?

We provide in home care where falls are common and can send pt. to ER.

The STEADI (Stopping Elderly Accidents Deaths and Injuries) toolkit reviewed in the presentation, is an evidence-based toolkit designed by the CDC for healthcare and service providers for successfully incorporating Medicare-reimbursable fall prevention interventions (such as assessing the individual's risk for falls, providing the necessary treatment and/or education, referring the individual to evidence-based fall prevention exercise programs in the community such as those offered at OLLI at UTMB Health, Galveston, TX).

Would you be willing to take the time to learn more about this toolkit by visiting the www.cdc.gov/STEADI website and to determine how you can best incorporate one or more components of the toolkit within the services you provide to older adults? (circle one bullet: yes or no)

- ☒ Yes
☐ No

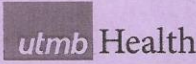

Why?

I'm interested in providing further education to my staff... ~~including~~ RN, PT, OTs

Thank you for taking time to help us learn more about your experience. We appreciate your time and your interest in OLLI and the 'fall prevention training – role of the provider'. If you have additional comments, please feel free to write them on the reverse side of this page.

Page 2 of 2

Figure 8: Example of the Evaluation Forms completed by the Older Adults following the Individual-Level Training Seminar

Osher Lifelong Learning Institute (OLLI) at UTMB Health
 301 University Blvd, Galveston, TX 77555-0972—Located at 4700 Broadway, Suite B101

Fall Prevention at Home – A training seminar for older adults living in the community
 Instructor: Kshitija (“Kay”) Kulkarni

Please assess the overall quality and effectiveness of the presentation? *One is lowest rating. Ten is best.*

Lowest rating 1 2 3 4 5 6 7 8 9 10 Highest Rating

Why? all inclusive!

Please evaluate the effectiveness of the presenter? *One is lowest rating. Ten is best.*

Lowest rating 1 2 3 4 5 6 7 8 9 10 Highest Rating

Why? Covered the topic, completely.

Will you recommend this presentation to friends?

Definitely Will Not 1 2 3 4 5 6 7 8 9 10 **Definitely Will**

Please explain To maintain safety.

What was most valuable about this presentation?

helpful suggestions!

How might the presentation be changed in the future?

N/A

What additional steps, support, or information might we offer to you?

N/A

Thank you for taking time to help us learn more about your experience. We appreciate your time and your interest in OLLI and the ‘fall prevention’ training seminar. If you have additional comments, please feel free to write them on the reverse side of this page.

Summary of Methods for the Current Capstone Project

This project involved fall prevention training seminars to the older adults living in the community as well as to their providers, all of which were delivered at the Osher Lifelong Learning Institute in Galveston, Texas, part of UTMB Health (OLLI). The director of OLLI, Dr. Michelle Sierpina and the staff at OLLI helped in the coordination of the training seminars at their location. This project was guided by Dr. Kristen Peek, Dr. Catherine Cooksley and Dr. Michelle Sierpina.

The first step in the development of the training seminars involved a thorough review of literature on falls and fall prevention among older adults. Power-point presentations were developed to summarize this information – incorporating pictorial and visual aids such as graphs, figures and videos where appropriate. Online resources were compiled and formatted for developing tailored handouts for dissemination. Two separate types of training seminar (individual-level and provider-level) and two separate sets of deliverables: training packages (for the individual and for the provider) were developed. Flyers were created and displayed at OLLI informing members of the upcoming training seminar(s) (Appendix 12). The training seminar for the providers at the Galveston Aging Care Network Breakfast Talk was scheduled six months in advance.

This project contributed to the mission of OLLI by providing education to the members of OLLI, who are adults age 50 years and older, living in the community, as well as to their providers, related to fall risk reduction. The individual-level training, delivered to members of OLLI, empowered them with newer ways that they could implement to improve their personal health-related

quality of life, by reducing the risk of the adverse health event of a potentially detrimental unintentional fall that they would have otherwise experienced within their home environment. From the 'Fatal Injury Data' tool on the Web-based Injury Statistics Query and Reporting System (WISQARS) of the Centers for Disease Control and Prevention (CDC), it is evident that the death rates due to unintentional falls are also high in majority of states among the individuals of age group of 55-65 years⁵. Given that this latter age-group, which is even younger than that primarily discussed earlier (65 years and older), further reaffirms the appropriateness of choice of the target population for this project – namely, the members of OLLI at UTMB. Although the population served by OLLI did not completely represent the greater elderly population of Houston-Galveston, their demographics provided a sufficient training group on which to test the training materials and proved to be very receptive and appropriate for this project. Specific age was not collected, but based on my clinical experience, the audience appeared to be 65 years and older in age. One attendee mentioned she was 95 years old. All the attendees attested that they were concerned about their own risk of falling.

Regarding the provider training group, although specific demographics were not collected, those attendees also provided an appropriately representative population of providers in this area.

Thus, the contribution to the host organization extends in this respect, given that OLLI serves individuals of age 50 years and older, living in the community. This health education and health promotion offered at OLLI

contributed as a preventive approach – educating individuals who may have been currently at a moderate risk to now be at a low risk because of the new knowledge and awareness gained, or would have potentially developed low to moderate risk, without this newer perspective and level of awareness. Course description that was included in the Fall 2015 syllabus of OLLI describing the free training sessions on fall prevention is provided in Appendix 11.

CHAPTER 3

Results

Results accomplished through this capstone project

Individual-level Training Seminars

Among the attendees of the individual-level training seminars who provided feedback, 87.5% found the content of the presentation and handouts valuable and helpful in enabling them to identify individual-level fall risk factors as well as fall hazards within their home environment. The same percentage rated the effectiveness of the presentation and that of the presenter to be the best (rating 10 on 10 = highly effective), with one attendee rating 8 on 10 (effective) for these two items/questions.

Majority of the attendees of the individual-level training seminars attested that the information presented was valuable and useful for reducing their own risk of falls, and that they felt more self-confident than before attending the seminar regarding their own ability to take the necessary measures including the immediate next step to reduce their own risk of falls.

Provider-level Training Seminar

Among the attendees of the provider-level training seminars who provided feedback, 100% attested that the information presented was useful for the services they provide to older adults at risk of falling. Nearly 86% were willing to invest their time in learning more about the STEADI toolkit and how they can utilize the resources in the toolkit to incorporate within their routine service delivery.

More than 71% rated the effectiveness of the presentation to be the highest (highly effective: 4 attendees rated 10 on 10, and 1 attendee rated 9 on 10), and 28.6% rated the presentation to be effective (one attendee rated 7 on 10, and another 8 on 10). Nearly 86% rated the presenter to be highly effective (6 out of the 7 attendees rated 10 on 10) and one (14%) rated the presenter to be effective (rating 7 on 10).

Jones and colleagues have reported that limited time and cost are barriers perceived by the health care providers for incorporating preventive services, such as those proposed by STEADI, into their clinical practice³⁰. This was in agreement to what was discovered through the evaluation forms, where this reluctance was obvious through the negative responses for the question on learning about and adopting some or all components of the STEADI toolkit.

The healthcare providers attested having the knowledge regarding falls being a common health issue among older adults. The non-medical service providers, although aware of the problem of falls among older adults as being a common one. The non-medical service admitted that they were unaware of the falls being indicative of a poor health status. Both the healthcare providers and the non-medical service providers, although unaware about, were receptive to, information on how definitive measures could be implemented to reduce fall risk among their older adult clientele. The provider-level training seminar attendees responded positively to questions asking if they found the information presented to be useful for potentially incorporating into their service delivery in the future.

Summary of Information Gathered from Individual-level Training Seminars and the Provider-level Training Seminar

A total of 8 out of all the 25 attendees from the four individual-level training sessions, and 7 out of all the 20 attendees from the provider-level training session provided feedback by completing the evaluation form. Thus, the response rate was approximately 30% for each of the two types of training seminar provided. Table 1 describes the information gathered through the evaluation forms for the individual-level training seminars, and Table 2 describes the information through the evaluation forms for the provider-level training seminar.

The feedback given by the audience in the form of the evaluation forms provided insight about their perspective of whether the seminar content was considered as useful information.

Table 1: Verbatim description of information obtained through the evaluation forms completed by the attendees of the individual-level training seminars

Question Number	Question	Attendee Number	Rating	Explanation
1	Overall quality and effectiveness of presentation	1	10	An avid audience who need the info!
		2	10	-
		3	8	-
		4	10	-
		5	10	-
		6	10	-
		7	10	-
		8	10	All inclusive!
2	Effectiveness of the presenter	1	10	High energy, good speaking voice
		2	10	-
		3	8	-
		4	10	-
		5	10	-
		6	10	-
		7	10	-
		8	10	Covered the topic completely
3	"Will you recommend this presentation to friends?"	1	10	Speaker very sincerely wants us to prevent falls – and I am hearing more & more of us who are falling!
		2	10	-
		3	8	-
		4	10	-
		5	9	-
		6	10	-
		7	10	-
		8	10	To maintain safety.
4	"What was the most valuable about this presentation?"	1	NA	-
		2		Helps around the house.
		3		How to change the home to prevent falls.
		4		Reminders and hand-outs for discussion.
		5		Pointing out hazards around the house that I don't think about.
		6		Very organized.
		7		She was wonderful! Hand-outs were great!
		8		Helpful suggestions!
5	"How might the presentation be changed in the future?"	1	NA	-
		2		-
		3		-
		4		-
		5		-

		6		More interaction.
		7		-
		8		N/A
6	"What additional steps, support, or information might we offer to you?"	1	NA	-
		2		-
		3		-
		4		-
		5		-
		6		Q & A
		7		-
		8		N/A

Footnotes: 1. "-" denotes: no response (left blank)

2. Rating ranged from 1 to 10, 1=lowest rating, 10=best.

3. For question 3: rating ranged from 1 to 10, 1 = Definitely will not, 10 = Definitely will.

4. Rating applied to only questions 1 to 3.

5. Responses in the explanation column are verbatim.

Table 2: Verbatim description of information obtained through the evaluation forms completed by the attendees of the provider-level training seminars

Question Number	Question	Attendee Discipline	Rating or Yes/No	Explanation
1	"Please specify your discipline (circle bullets for all that apply):" (bullet points for disciplines of all kinds of service providers for older adults ranging from healthcare disciplines to non-medical services, and religious/faith-based organizations)	Nurse Administrator or Manager (unspecified type of setting) Community Liaison Home care (non-med) provider Administrator: Long term care Social Worker & Community Service Professional: Executive Director of a Senior Day Program Director of Home Health Services	NA	NA
2	Overall quality and effectiveness of Presentation	Nurse Administrator or Manager (unspecified type of setting) Community Liaison Home care (non-med) provider Administrator: Long term care Social Worker	7 9 10 10 10 8	- - - - Awesome speech & educational.

		& Community Service Professional: Executive Director of a Senior Day Program		
		Director of Home Health Services	10	My nurses deal with falls in home on regular basis in homes.
3	Effectiveness of the presenter	Nurse	10	-
		Administrator or Manager (unspecified type of setting)	10	-
		Community Liaison	10	-
		Home care (non-med) provider	10	-
		Administrator: Long term care	10	-
		Social Worker & Community Service Professional: Executive Director of a Senior Day Program	7	Keep presentation time shorter. It is good information but could be broken into segments.
		Director of Home Health Services	10	Engaging, charming and gave great info.
4	"Was the information provided in the presentation useful for the services you provide to older adults who may be at risk of falling?"	Nurse	Yes	-
		Administrator or Manager (unspecified type of setting)	Yes	-
		Community Liaison	Yes	-
		Home care (non-med) provider	Yes	-
		Administrator: Long term care	Yes	-
		Social Worker & Community Service Professional: Executive Director of a Senior Day Program	Yes	We teach health ed. and safety to our participants and I lead a caregiver support group
		Director of Home Health Services	Yes	We provide in home care where falls are common and can send pt. to ER
5	...Would you be willing to take time to learn about the STEADI toolkit to determine how you can incorporate one or more	Nurse	No	-
		Administrator or Manager (unspecified type of setting)	Yes	-
		Community	Yes	-

	components within the services you provide to older adults?	Liaison		
		Home care (non-med) provider	Yes and No	-
		Administrator: Long term care	Yes	-
		Social Worker & Community Service Professional: Executive Director of a Senior Day Program	Yes	Valuable and up to date info. Thank you taking the time to present at GACN (Galveston Aging Care Network)
		Director of Home Health Services	Yes	I'm interested in providing further education to my staff... RN, PT, OTs.

Footnotes: 1. "-" denotes: no response (left blank)

2. Rating ranged from 1 to 10, 1=lowest rating, 10=best.

4. Numerical rating applied to only questions 2 and 3, Questions 4 and 5 were Yes/No.

5. Each of questions 1 through 5 asked for explanation ("Why?")

6. Responses in the explanation column are verbatim.

CHAPTER 4

Discussion and Future Research Directions

The overall goals of this capstone were to address the descriptive epidemiology of falls among older adults; the description of the community health education and health promotion project in the form of training seminars for fall risk reduction among older adults living in the community delivered to both the individuals (older adults) and their providers (healthcare and non-medical services), and provide a description of the results of the training seminars delivered.

Value of this capstone project

There are several strengths to what was accomplished in this capstone project. First, the value of this project lies in the fact that beyond just compiling and reiterating what exists in the literature, training seminars were developed and delivered to end users in the real world – namely, the community-dwelling older adults who may be at risk of falling as well as to their healthcare and service providers. Secondly, audience feedback on the information delivered and disseminated was obtained, to seek an understanding of whether the target population found the information useful in their respective individual case. The third strength (or success) of the project lies in the fact that most of the attendees of the individual-level training seminars expressed that the seminars provided them with useful information for reducing their own risk of falls, and that they were willing to implement the suggestions provided in the seminars.

Given the interactive nature of the provider-level seminar, all the healthcare as well as non-medical providers in the audience responded by show of hands that they all were well-aware that falls are a common problem among older adults. However, the non-medical service providers were unaware that falls are indicative of an underlying health condition that may need medical attention. The healthcare providers had a reactive rather than a proactive approach – providing interventions to reduce risk of future falls after the occurrence of a fall was reported by their older adult patient/client. The providers were eager to learn how to successfully incorporate fall risk reduction assessments and interventions as part of their routine non-medical or healthcare services delivery model. Just as in the individual-level training seminars, the attendees of the provider-level training seminar also attested that they found the information presented to be useful for reducing the risk of falls among their older adult clients, and were willing to further explore the resources shared by the presenter in order to do so.

This is a successful beginning step towards reducing fall risk among older adults living in the community, for several reasons. The first reason being, that the initial step to create change, is to increase the awareness that status quo (no change) is a problem that will escalate if not effectively addressed, as well as to inspire the willingness to take the measures towards creating change. This was achieved through the current capstone project, among the older adult residents and their healthcare and other service providers of the local communities of the greater Houston-Galveston area, who attended the training seminars at OLLI. The below-cited literature also reinforces the importance of this project.

The annual Medicare costs for falls among older adults are estimated to be \$31.3 billion³¹. Older adult population in the US is expected to increase by 55% by the year 2030³². It is estimated that 48.8 million falls and 11.9 million fall injuries could occur to the projected older adult population of 2030 if status quo is maintained and effective fall prevention interventions are not implemented across the nation¹.

Success Stories of implementing STEADI toolkit

The following stories about successfully utilizing the STEADI toolkit to reduce falls, fall risk, and other pertinent health outcomes further reinforce the importance of the information that was relayed through the training seminars delivered as part of the current capstone project.

The Oregon Health and Science University (OHSU) with the support of the Oregon Health Authority (state health department), integrated the STEADI toolkit for healthcare providers in a clinical setting over a period of five years with a focus on fall interventions at the levels of the clinical practice, the larger healthcare system, and at the community.

OHSU incorporated the STEADI algorithm into their existing screening process in the clinic. Integrating the algorithm within their workflow enabled their electronic medical/health record (EHR) system to apply an annual falls screening maintenance alert to the medical charts of all of their patients of age 65 years and above. Through their EHR the healthcare professionals were able to assign codes based on the individual's level of risk of falling which enabled maintaining high standards of care and served as quality measure for measuring healthcare

outcomes. Partnering with the state health department, having clinic champions (delegated work force), developing tools in the EHR for successfully incorporating the STEADI screening and evaluation process, seeking feedback, keeping partners informed, and engaging community partners and collaborators; resulted in OHSU's success in implementing effective fall prevention ³³.

The following success story reinforces the value of the current capstone project by implementing multifactorial fall prevention interventions utilizing the STEADI resources for both the provider as well as the individual – all of the aspects that were emphasized during the training seminars provided in the current capstone project. This story was obtained from the success story webpage of the STEADI toolkit for providers, titled “Keep Them STEADI: Preventing Older Adult Falls in Hospital-Based Settings”. The multidisciplinary team at the Rees-Jones Trauma Center, including trauma surgeons, primary care physicians, geriatricians, physical therapists, occupational therapists, and speech therapists, pharmacists, and community health paramedics, worked together for implementing the STEADI toolkit as part of a two-year program for fall prevention among older adults. All older adults were screened for identifying modifiable fall risk factors as well for obtaining information regarding any falls they may have already experienced, as part of their electronic health record³³.

Following the screening, those patients identified as being potentially at risk of falling were provided thorough clinical evaluations and interventions including, but not limited to, functional assessments for evaluating gait, strength and balance, focused physical examination addressing modifiable and/or

treatable fall risk factors, assessing for and managing postural hypotension or dizzy spells, reviewing and managing medications including vitamin D supplementation, assessing visual alertness and improving vision, addressing home safety and providing information on how to prevent falls, and identifying and linking the patients to existing community exercise and fall prevention programs³³.

Upon implementing all of the above-mentioned aspects of the STEADI toolkit at various levels of practitioners within the interdisciplinary team, some drastically positive outcomes were achieved. These positive health outcomes included: reduction in the average length of hospital stay from nearly 8 days to less than 6 days; increase in proportion of older adults being discharged back home (or into the community) from little over 46% to more than 63%; and a reduction in older adults returning with a recurrent fall from 1.5% to 0.6%³³.

Limitations

Limitations and lessons learned pertaining to the Individual-level Training Seminars

All four training sessions were scheduled at the outset. Instead, planning just one initial session to begin with and then reconvening with my project advisors to better plan the next session - based on the audience performance, participation, reactions, comments and questions, would have probably been a better strategy to adopt. One trial run was conducted with advisors and planners one week before commencing the training sessions. This was followed by different advisors attending two separate sessions with each providing valuable input on my performance. Reconvening at least one more mock run with

advisors, that incorporated this input, would have resulted in an even better product delivered. Even if it meant fewer training sessions delivered – they probably may have created a greater impact.

Not all the attending audience chose to complete the evaluation. Of the total of 25 attendees from the four seminars combined, only a total of eight attendees completed the evaluation forms.

Since demographic information was not collected, it remains unknown if the audience cohort and their distribution based on other characteristics such as race/ethnicity was in congruence with the general population distribution.

Limitations and lessons learned pertaining to the Provider-level Training Seminar

This capstone project had at least three major limitations. First, additional follow-up with providers to understand practical difficulties and feasibility issues in implementing fall risk reduction assessments and interventions would have been beneficial. Secondly, among the attendees of the provider-level training seminar was an orthopedic surgeon who regularly performs lower extremity joint replacement procedures at UTMB. Insight from this individual may have been able provided some helpful feedback. Because of time constraints, the surgeon was unable to complete the evaluation form, both after the seminar as well as by email. Not all the attending audience chose to complete the evaluation. Of the total of 20 attendees from the provider-level training seminar, only a total of seven attendees completed the evaluation forms.

Thirdly, the provider-level training seminar could have been more effective if Medicare reimbursement for fall prevention interventions were emphasized to greater extent. The attendees were informed that Medicare reimburses for preventive services including fall risk assessments and fall prevention interventions. However, future sessions should highlight further details in this aspect, such as the specific payment and delivery reforms in the reimbursement process by the Centers for Medicare & Medicaid Services (CMS), including: Welcome to Medicare Visit, Medicare Annual Wellness Visit, and the Medicare Shared Savings Accountable Care Organization Program³⁴. The CMS also link the incentives for the healthcare providers to the fall prevention quality measures. This is done through the Physician Quality Reporting System (PQRS) in the Merit-Based Incentive Program. The PQRS includes two quality measures for falls: Falls Risk Assessment and Falls Plan of Care³⁵.

Future Research Directions

Future public health research efforts should emphasize to the attendees of the provider-level training seminar that these payment and delivery reforms are opportunities. Not just for making fall prevention a routine part of clinical practice and eliminating barriers for providing the necessary fall prevention interventions and services, but improving quality of care. In turn, the health-related quality of life of the older adults will be improved by preventing falls from occurring.

As part of the individual-level training seminars, the OLLI members were urged to complete the check for safety checklist and address all of the

recommendations for simple solutions. To take the next steps toward accomplishing these solutions, it was suggested to seek support from a family member, friend, their healthcare or other service provider, OLLI staff, or the Area Agency on Aging (AAA, another resource provided as part of the deliverables). To enhance future research efforts, further follow-up with these OLLI members would be useful. This follow-up can provide insight into the practical difficulties and feasibility issues faced by the members in implementing self-risk assessment and risk management approaches. Such follow-up can also inform public health professionals of any difficulties the end users may be facing in seeking the needed support or guidance from their healthcare or other provider, community resources such as those at OLLI, and through resources provided by the AAA.

Expanding the reach of the individual level training sessions to other community elderly groups would allow for greater distribution of fall prevention information. Some examples where the training sessions would be beneficial include senior centers, multipurpose community centers offering elder day programs and subsidized elderly housing units.

Population-based studies to understand how hospital admissions for fall-related injuries differ by age, gender, race/ethnicity, socio-economic status, political and geographical location, among older adults living in the community, would be informative. It would also be insightful to conduct such large scale prospective studies on community-dwelling older adults hospitalized for fall-related injuries, to understand care transitions for post-acute rehabilitation

services, access to out-patient and home-health services, and long-term follow-up and resultant health outcomes.

CHAPTER 5

Conclusion

This capstone project involved delivering individual-level and provider-level training seminars for fall prevention among older adults living in the community. The primary objective of the individual-level training seminar was raise awareness among the audience about falls and fall risks. Layman's terminology was used to present the seminar materials. Comprehensive information based on existing evidence-based research regarding several aspects related to falls among older adults was presented. These aspects included prevalence of older adult falls across the United States, individual-level fall risk factors, and environmental fall hazards within the home environment. The audience were also educated on what they can do to minimize their personal risk. Informational resources such as those of local governmental and non-governmental agencies that provide services to help reduce fall risks, were distributed. Last, but not the least, audience feedback, on the information delivered, was obtained.

Through these formal presentations and talks, a clearer understanding of the perspectives and fears of the community-dwelling older adults related to falls as well as their related to their overall health status, was obtained. The interactive nature of the training seminars offer opportunities to rectify the

misconceptions that exist among the older adults regarding individual-level as well as environmental risk factors for falls.

This is where the importance of providing such health education to the members of the community lies. During the interaction with the older adults and through the feedback provided by them in the evaluation forms, the older adult audience reported that the information delivered through the seminars had increased their level of awareness. Increased level of awareness of health risks translates to positive health behaviors, which in turn would results in a healthier community²⁹.

The need for delivering a provider-level training seminar was identified as the next step based on what was discovered from the individual-level training seminars, that older adults in community need further programs to better empower and equip them to continue living safely within their homes/communities for a longer time to come by delaying the preventable adverse health event, namely an unintentional fall. This next step was deemed necessary because, as admitted by the attendees of the individual-training seminars, older adults are unaware that they need to bring up in discussion with their healthcare provider any loss of balance or fall that they may have experienced. Thus, older adults lack the awareness that the occurrence of a fall is directly related to their health status.

The next step was thus defined – developing and delivering a provider-level training seminar. The primary objective of the provider-level seminar was to inform the healthcare providers regarding the knowledge gaps, misconceptions,

perspectives and fears that their older adult clientele may have related to falls and fall risks. The second objective was to urge the providers to deliberately interrogate their clients regarding history of falls or “almost falls (loss of balance)” as well as conduct a thorough formal evaluation regarding risk of falls. The third objective was to demonstrate exactly how they can: successfully incorporate fall risk assessments and multi-factorial fall risk reduction interventions into their routine practice/service delivery; utilize tools such as ‘the STEADI toolkit for providers’; and utilize other resources including, but not limited to their own healthcare professionals’ team, other specialists, and agencies and programs in the community.

A training seminar was developed and presented to the providers of healthcare services and non-medical services attending the Galveston Aging Care Network (GACN). Information based on existing evidence-based research regarding prevalence of falls among older adults, personal, healthcare and economic burden of falls, modifiable fall risk factors including biological, behavioral and environmental factors, and how to implement fall risk assessment and fall risk reduction interventions for the older adults they serve. This was done on January 14, 2016 in the form of a breakfast talk, delivered to various levels of healthcare providers serving in the Galveston area at the GACN hosted at the OLLI.

The attendees of the Individual-level Training Seminars were highly functional and active community members. From their attention, questions, and participation during the training sessions, it was evident that they were eager to

continue learning and maintaining optimal physical and psychological health. This was further confirmed by the fact that most attested to attending more than one type of exercise courses offered at OLLI. Despite being well informed about healthy living, however, the attendees voluntarily admitted that some of the key evidence-based fall prevention information presented during the trainings was new and counter-intuitive to them. The attendees also voluntarily admitted to feeling enlightened and empowered and better equipped to reduce their personal risk of experiencing a fall in the future, because of having attended the training seminars delivered. This reinforced what is stated in the literature that effective dissemination of key health information and health promotion is a proven method toward ensuring a healthier community and over time will reduce healthcare burden and costs ³⁶.

The attendees of the Provider-level Training Seminars were highly knowledgeable, experienced and dedicated providers of non-medical as well as healthcare services to older adults living in the communities of Galveston, Texas. From their questions, and participation during the training sessions, it was evident that the attendees were eager to learn about how they could take a more proactive than reactive approach for falls prevention. Most attested to believing that falls are issues that can be addressed only after they were reported to have occurred. The attendees also voluntarily admitted to feeling enlightened and empowered and better equipped to include a fall risk assessment and intervention as part of the routine services they provided.

This confirmed what has been stated in the interactive CDC webinar, that, provided the right tools, healthcare providers as well as non-medical service providers can implement a fall risk reduction program for older adults in the community ³⁶. It was also helpful for the providers to be more accepting of these suggestions for changing practices, to know that Medicare reimburses preventive services including conducting fall risk assessments and providing appropriate fall prevention interventions for older adults living in the community, at no cost to the beneficiary (older adult individual)³⁷, after the enactment of the Affordable Care Act³⁸.

This project was inspired by the public health concept of ‘aging-in-place’³⁹. This concept is based on the aging individual empowered to live independently and safely within their home environment, rather than being placed in an institution for life such as a long-term care facility. As a public health project, this capstone project contributed to educate not only the community members or end-users – the older adults living in the community but also the healthcare professionals and non-medical service providers serving them; regarding the key role a prevention approach can play in maintaining optimal health, and improving the health of the community – in this case, the aging population.

APPENDIX 1

Chart for Hospital Discharges during 2014 with the Clinical Classification code: Fall, by age group

		Number	
		Total number of discharges: N	Percent of discharges
All discharges		1,298,126	100.00
Age group	<1	4,235	0.33
	1-17	30,475	2.35
	18-44	90,800	6.99
	45-64	258,235	19.89
	65-84	557,630	42.96
	85+	356,715	27.48
	Missing	*	*

- Weighted national estimates from HCUP National (Nationwide) Inpatient Sample (NIS), [2014], Agency for Healthcare Research and Quality (AHRQ), based on data collected by individual States and provided to AHRQ by the States. Total number of weighted discharges in the U.S. based on HCUP NIS = 35,358,818. Statistics based on estimates with a relative standard error (standard error / weighted estimate) greater than 0.30 or with standard error = 0 in the nationwide statistics (NIS, NEDS, and KID) are not reliable. These statistics are suppressed and are designated with an asterisk (*).
- Beginning with the 2012 data, the National Inpatient Sample (NIS) was redesigned to optimize national estimates. The nationwide statistics in HCUPnet for years prior to 2012 were regenerated using new trend weights in order to permit longitudinal analysis. The regenerated data were posted to HCUPnet on 7/2/2014. The statistics for years prior to 2012 currently on HCUPnet will differ slightly from statistics obtained prior to 7/2/2014. For more information about the NIS redesign and trend weights, please view the [Overview of the NIS](#).
- See the ICD codes that comprise CCS categories
- Citation: HCUPnet, Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD. <https://hcupnet.ahrq.gov/>. For more information about HCUP data see <http://www.hcup-us.ahrq.gov/>

Source: HCUPNET

Date Created: March 31, 2017

APPENDIX 2

Hand-out: Houston-Galveston Area Agency on Aging

Address:

3555 Timmon Lane

Suite 120

City: Houston

State: TX

Zip: 77027

Website: <https://www.h-gac.com/human-services/aging/>

Contact Email: Jacqui.Johnson@h-gac.com

Office Phone: (713) 627-3200

Information Phone: (713) 627-3200

State Phone: 1-800-437-7396

Languages: English, Spanish

Description:

SERVICES INCLUDE:

In-Home services, Transportation, Legal Aid, Health Insurance Counseling, Ombudsman, and Information & Assistance.

Special Notes:

Ages 60+.

County Phone numbers:

Austin Co: 979-885-4188

Brazoria Co: 979-849-6132

Chambers Co: 409 -267-3559

Colorado, Wharton Co: 979-532-6430

Fort Bend, Waller Co: 281-633-2162

Galveston Co: 409-770-6251

Liberty Co: 281-592-1174, 936-336-7265

Matagorda Co: 361-972-9921

Montgomery Co: 936-756-5828

Hours: 8:00 AM - 5:00 PM - Central Time

APPENDIX 3

Image of Hand-Out: Rebuilding Together



Rebuilding Together®

Contact Us

1899 L Street NW, Suite 1000
Washington, DC 20036
800-473-4229
www.rebuildingtogether.org

REBUILDING TOGETHER ACROSS THE NATION

ALABAMA Central Alabama Lee County Morgan County	FLORIDA Broward County Miami/Dade North Central Florida Of the Palm Beaches Orlando Tampa Bay	MAINE Lewiston/Auburn Lincoln County	NEW MEXICO Albuquerque Sandoval County	TENNESSEE Knoxville Nashville
ARIZONA Bisbee/Naco Santa Cruz County Tucson Valley of the Sun	GEORGIA Atlanta Fort Valley Glynn County Gwinnett County Savannah Warner Robins Waycross	MARYLAND Anne Arundel County Baltimore Caroline County Charles County Christmas In April Frederick County Howard County Kent County Montgomery County Queen Anne's County	NEW YORK Dutchess County Long Island Mohawk Valley New York City Olean Saratoga County	TEXAS Austin El Paso Greater Dallas Houston San Antonio
ARKANSAS Northwest Arkansas			NORTH CAROLINA Of Greater Charlotte Of the Triangle Pitt County	VERMONT Greater Burlington
CALIFORNIA Central San Gabriel Valley East Bay North Greater Los Angeles Kern County Long Beach Monterey/Salinas Mountain Communities Oakland Peninsula Petaluma Rohnert Park/Cotati Sacramento San Diego San Francisco San Gabriel Valley Foothills Santa Rosa Sebastopol Silicon Valley Solano County Southern California Coordinating Council West San Gabriel Valley	ILLINOIS Aurora Henry County Metro Chicago Metropolis North Suburban Chicago Peoria Southwest Illinois	MASSACHUSETTS Boston Haverhill Lowell Worcester	NORTH DAKOTA Fargo-Moorhead Area Greater Bismarck/Mandan Area	VIRGINIA Alexandria Arlington/Fairfax/Falls Church Campbell County Fredericksburg Harrisonburg/Rockingham Loudoun County Orange/Louisa Counties Richmond Roanoke Tri-Cities
COLORADO Colorado Springs Metro Denver	INDIANA Delaware County Duneland Hebron Hobart/Lake Station Indianapolis La Porte Portage South Lake County St. Joseph County Valparaiso	MICHIGAN Detroit Ingham County Oakland County	OHIO Central Ohio Dayton Greater Cuyahoga Valley Lake County	WASHINGTON Grays Harbor Pacific County Seattle South Sound Spokane Thurston County
CONNECTICUT Fairfield County Hartford Litchfield County Manchester New Britain	IOWA Greater Des Moines Muscatine Quad Cities	MINNESOTA Twin Cities	OKLAHOMA Cleveland County Kiamichi Country Oklahoma City Tulsa	WEST VIRGINIA Charleston
DISTRICT OF COLUMBIA Washington	KANSAS Shawnee/Johnson County	MISSOURI Clay County Kansas City Christmas In October St. Louis	OREGON Portland Washington County	WISCONSIN Fox Valley Greater Milwaukee Manitowoc County Of Greater Green Bay Sheboygan County
	LOUISIANA Acadiana Baton Rouge Calcasieu New Orleans St. Landry	MONTANA Yellowstone County	PENNSYLVANIA Greater Harrisburg Philadelphia Pittsburgh	
		NEBRASKA Greater Fremont Omaha Washington County	RHODE ISLAND Greater Newport Providence	
		NEVADA Southern Nevada	SOUTH CAROLINA Hartsville Christmas In April	
		NEW JERSEY Bergen County Camden Essex County Jersey City		

Source website: <http://www.rebuildinghouston.org/about.htm>

Date retrieved: July 31, 2015

APPENDIX 4

Images of Hand-out: Check for Safety Brochure



**Check
for
Safety**

This checklist was produced with support
from the MetLife Foundation.



Centers for Disease
Control and Prevention
National Center for Injury
Prevention and Control



**A Home Fall
Prevention
Checklist for
Older Adults**



For more information, contact:
Centers for Disease Control and Prevention
1 (800) CDC-INFO (232-4636)
www.cdc.gov/injury

cdc/ncipc

2014





"Making changes in our home to prevent falls is good for us and for our granddaughter when she comes to visit."

FALLS AT HOME

Each year, thousands of older Americans fall at home. Many of them are seriously injured, and some are disabled. In 2011, nearly 23,000 people over age 65 died and 2.4 million were treated in emergency departments because of falls.

Falls are often due to hazards that are easy to overlook but easy to fix. This checklist will help you find and fix those hazards in your home.

The checklist asks about hazards found in each room of your home. For each hazard, the checklist tells you how to fix the problem. At the end of the checklist, you'll find other tips for preventing falls.

1										✓	Check for Safety		✓	Check for Safety								2
---	--	--	--	--	--	--	--	--	--	---	------------------	--	---	------------------	--	--	--	--	--	--	--	---



"Last Saturday our son helped us move our furniture. Now all the rooms have clear paths."

FLOORS: Look at the floor in each room.

Q: When you walk through a room, do you have to walk around furniture?

- ☐ Ask someone to move the furniture so your path is clear.

Q: Do you have throw rugs on the floor?

- ☐ Remove the rugs or use double-sided tape or a non-slip backing so the rugs won't slip.

Q: Are there papers, books, towels, shoes, magazines, boxes, blankets, or other objects on the floor?

- ☐ Pick up things that are on the floor. Always keep objects off the floor.

Q: Do you have to walk over or around wires or cords (like lamp, telephone, or extension cords)?

- ☐ Coil or tape cords and wires next to the wall so you can't trip over them. If needed, have an electrician put in another outlet.

3



Check for safety



Check for safety

4

STAIRS AND STEPS:

Look at the stairs you use both inside and outside your home.

Q: Are there papers, shoes, books, or other objects on the stairs?

☐ Pick up things on the stairs. Always keep objects off stairs.

Q: Are some steps broken or uneven?

☐ Fix loose or uneven steps.

Q: Are you missing a light over the stairway?

☐ Have an electrician put in an overhead light at the top and bottom of the stairs.

Q: Do you have only one light switch for your stairs (only at the top or at the bottom of the stairs)?

☐ Have an electrician put in a light switch at the top and bottom of the stairs. You can get light switches that glow.

Q: Has the stairway light bulb burned out?

☐ Have a friend or family member change the light bulb.

Q: Is the carpet on the steps loose or torn?

☐ Make sure the carpet is firmly attached to every step, or remove the carpet and attach non-slip rubber treads to the stairs.

Q: Are the handrails loose or broken? Is there a handrail on only one side of the stairs?

☐ Fix loose handrails or put in new ones. Make sure handrails are on both sides of the stairs and are as long as the stairs.



5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Check for Safety	<input checked="" type="checkbox"/>	Check for Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6
---	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	-------------------------------------	------------------	-------------------------------------	------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	---

KITCHEN: Look at your kitchen and eating area.

Q: Are the things you use often on high shelves?

- ☐ Move items in your cabinets. Keep things you use often on the lower shelves (about waist level).

Q: Is your step stool unsteady?

- ☐ If you must use a step stool, get one with a bar to hold on to. Never use a chair as a step stool.

BATHROOMS: Look at all your bathrooms.

Q: Is the tub or shower floor slippery?

- ☐ Put a non-slip rubber mat or self-stick strips on the floor of the tub or shower.

Q: Do you need some support when you get in and out of the tub or up from the toilet?

- ☐ Have grab bars put in next to and inside the tub and next to the toilet.





BEDROOMS: Look at all your bedrooms.

Q: Is the light near the bed hard to reach?

- ☐ Place a lamp close to the bed where it's easy to reach.



"I put a lamp on each side of my bed. Now it's easy to find the light if I wake up at night."

Q: Is the path from your bed to the bathroom dark?

- ☐ Put in a night-light so you can see where you're walking. Some night-lights go on by themselves after dark.

9



Check for Safety



Check for Safety

10

Other Things You Can Do to Prevent Falls

- ☐ Do exercises that improve your balance and make your legs stronger. Exercise also helps you feel better and more confident.



- ☐ Have your doctor or pharmacist look at all the medicines you take, even over-the-counter medicines. Some medicines can make you sleepy or dizzy.
- ☐ Have your eyes checked by an eye doctor at least once a year and update your glasses.
- ☐ Get up slowly after you sit or lie down.
- ☐ Wear shoes both inside and outside the house. Avoid going barefoot or wearing slippers.
- ☐ Improve the lighting in your home. Put in brighter light bulbs. Florescent bulbs are bright and cost less to use.
- ☐ It's safest to have uniform lighting in a room. Add lighting to dark areas. Hang lightweight curtains or shades to reduce glare.
- ☐ Paint a contrasting color on the top edge of all steps so you can see the stairs better. For example, use a light color paint on dark wood.

11



Check
for
Safety



Check
for
Safety

12



"I feel stronger and
better about myself
since I started taking
Tai Chi."

Other Safety Tips

- ☐ Keep emergency numbers in large print near each phone.
- ☐ Put a phone near the floor in case you fall and can't get up.
- ☐ Think about wearing an alarm device that will bring help in case you fall and can't get up.

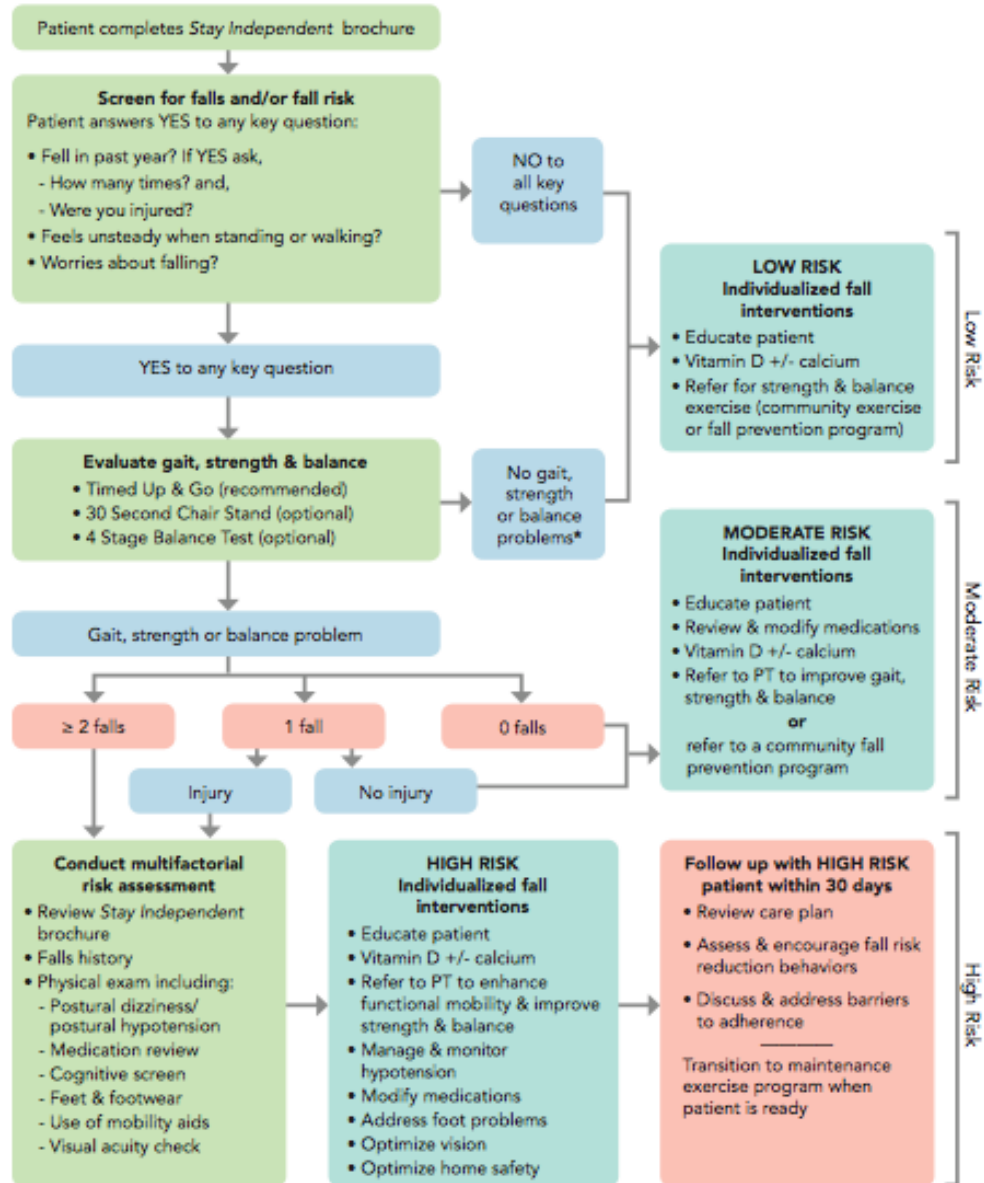


Source website: <https://www.cdc.gov/steady/>
Date retrieved: August 21, 2015

APPENDIX 5

Algorithm for fall risk assessment and intervention

Algorithm for Fall Risk Assessment & Interventions



*For these patients, consider additional risk assessment (e.g., medication review, cognitive screen, syncope)



Centers for Disease
Control and Prevention
National Center for Injury
Prevention and Control

STEADI Stopping Elderly
Accidents, Deaths & Injuries

Source website: <https://www.cdc.gov/steady/>
Date retrieved: January 9, 2016

APPENDIX 6

Check Your Risk of Falling

Check Your Risk for Falling

Please circle "Yes" or "No" for each statement below.			Why it matters
Yes (2)	No (0)	I have fallen in the past year.	People who have fallen once are likely to fall again.
Yes (2)	No (0)	I use or have been advised to use a cane or walker to get around safely.	People who have been advised to use a cane or walker may already be more likely to fall.
Yes (1)	No (0)	Sometimes I feel unsteady when I am walking.	Unsteadiness or needing support while walking are signs of poor balance.
Yes (1)	No (0)	I steady myself by holding onto furniture when walking at home.	This is also a sign of poor balance.
Yes (1)	No (0)	I am worried about falling.	People who are worried about falling are more likely to fall.
Yes (1)	No (0)	I need to push with my hands to stand up from a chair.	This is a sign of weak leg muscles, a major reason for falling.
Yes (1)	No (0)	I have some trouble stepping up onto a curb.	This is also a sign of weak leg muscles.
Yes (1)	No (0)	I often have to rush to the toilet.	Rushing to the bathroom, especially at night, increases your chance of falling.
Yes (1)	No (0)	I have lost some feeling in my feet.	Numbness in your feet can cause stumbles and lead to falls.
Yes (1)	No (0)	I take medicine that sometimes makes me feel light-headed or more tired than usual.	Side effects from medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I take medicine to help me sleep or improve my mood.	These medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I often feel sad or depressed.	Symptoms of depression, such as not feeling well or feeling slowed down, are linked to falls.
Total _____		Add up the number of points for each "yes" answer. If you scored 4 points or more, you may be at risk for falling. Discuss this brochure with your doctor.	

This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk self-assessment tool (Rubenstein et al. *J Safety Res*; 2011;42(6):493-499). Adapted with permission of the authors.

Source website: <https://www.cdc.gov/steady/>

Date retrieved: August 21, 2015

APPENDIX 7

‘Talking About Fall Prevention with Your Patients’



Talking about Fall Prevention with Your Patients



Many fall prevention strategies call for patients to change their behaviors by:

- Attending a fall prevention program
- Doing prescribed exercises at home
- Changing their home environment

We know that behavior change is difficult. Traditional advice and patient education often does not work.

The Stages of Change model is used to assess an individual's readiness to act on a new, healthier behavior. Research on the change process depicts patients as always being in one of the five "stages" of change.

Behavior change is seen as a dynamic process involving both cognition and behavior, that moves a patient from being uninterested, unaware, or unwilling to make a change (precontemplation); to considering a change (contemplation); to deciding and preparing to make a change (preparation); to changing behavior in the short term (action); and to continuing the new behavior for at least 6 months (maintenance).

The Stages of Change model has been validated and applied to a variety of behaviors including:

- Exercise behavior
- Contraceptive use
- Smoking cessation
- Dietary behavior

Stages of Change model	
Stage of change	Patient cognition and behavior
Precontemplation	Does not think about change, is resigned or fatalistic Does not believe in or downplays personal susceptibility
Contemplation	Weights benefits vs. costs of proposed behavior change
Preparation	Experiments with small changes
Action	Takes definitive action to change
Maintenance	Maintains new behavior over time

From: Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot* 1997;12(1):38-48.



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When talking with a patient, applying the Stages of Change model can help you match your advice about fall prevention to your patient's stage of readiness.

The following sections give examples of patient-provider exchanges for each of the first four stages and offer possible responses to help move the patient from one stage to another. The maintenance stage is not included because older adults are most often in the early stages of behavior change for fall prevention.

Examples of Conversations about Fall Prevention

Precontemplation stage	Patient says:	Provider says:
<p>The patient doesn't view him or herself as being at risk of falling.</p> <p>Goal: The patient will begin thinking about change.</p> <p>To move the patient to the contemplation stage, provide information and explain the reasons for making changes.</p>	Falls just happen when you get old.	It's true that falling is very common. About a third of all seniors fall each year. But you don't have to fall. There are specific things you can do to reduce your chances of falling.
	Falling is just a matter of bad luck. I just slipped. That could have happened to anybody.	As we age, falls are more likely for many reasons, including changes in our balance and how we walk.
	My 92 year-old mother is the one I'm worried about, not myself.	Taking steps to prevent yourself from falling sooner rather than later can help you stay independent.
	It was an accident. It won't happen again because I'm being more careful.	Being careful is always a good idea but it's usually not enough to keep you from falling. There are many things that you can do to reduce your risk of falling.
	I took a Tai Chi class but it was too hard to remember the forms.	Maybe you'd enjoy taking a balance class instead.

Source website: <https://www.cdc.gov/steady/>
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APPENDIX 8

Fall risk checklist

Fall Risk Checklist

Patient: _____ Date: _____ Time: _____ AM/PM

Fall Risk Factor Identified	Factor Present?	Notes
Falls History		
Any falls in past year?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Worries about falling or feels unsteady when standing or walking?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medical Conditions		
Problems with heart rate and/or rhythm	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Cognitive impairment	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Incontinence	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Depression	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Foot problems	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Other medical conditions (Specify)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medications (Prescriptions, OTCs, supplements)		
CNS or psychoactive medications	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medications that can cause sedation or confusion	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medications that can cause hypotension	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Gait, Strength & Balance		
Timed Up and Go (TUG) Test ≥12 seconds	<input type="checkbox"/> Yes <input type="checkbox"/> No	
30-Second Chair Stand Test Below average score based on age and gender	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4-Stage Balance Test Full tandem stance <10 seconds	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Vision		
Acuity <20/40 OR no eye exam in >1 year	<input type="checkbox"/> Yes <input type="checkbox"/> 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?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Other Risk Factors (Specify)		
	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Source website: <https://www.cdc.gov/steady/>
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APPENDIX 9

Integrating Fall Prevention into Practice

Integrating Fall Prevention into Practice

Working together, many types of healthcare providers can help identify and manage patients at risk of falling. You can help reduce falls by screening all older persons once a year for previous falls and/or balance problems. For those who screen positive, perform a fall risk assessment and help patients understand and act upon the findings using proven prevention strategies.

Assessments and/or Interventions	Identify who in your practice can do this	What it involves
Screen all older patients for falls		<ul style="list-style-type: none"> Have each patient complete the <i>Stay Independent</i> brochure—help if necessary.
Identify modifiable fall risk factors		<ul style="list-style-type: none"> Review <i>Stay Independent</i> brochure & take a falls history.
Evaluate gait, lower body strength & balance Address identified deficits		<ul style="list-style-type: none"> Administer one or more gait, strength & balance tests: <ul style="list-style-type: none"> Timed Up & Go Test (Recommended) <ul style="list-style-type: none"> Observe & record patient's postural stability, gait, stride length & sway. 30-Second Chair Stand Test (Optional) 4-Stage Balance Test (Optional) As needed, refer to physical therapist or recommend community exercise or fall prevention program. <ul style="list-style-type: none"> PTs can assess gait & balance, provide one-on-one progressive gait & balance retraining, strengthening exercises, & recommend & teach correct use of assistive devices.
Conduct focused physical exam Address modifiable and/or treatable risk factors		<p>In addition to a customary medical exam:</p> <ul style="list-style-type: none"> Assess muscle tone, look for increased tone, hypertonia (cogwheeling). Screen for cognitive impairment & depression. Examine feet & evaluate footwear. Look for structural abnormalities, deficits in sensation & proprioception. If needed, refer to podiatrists or podorthotists. <ul style="list-style-type: none"> These specialists can identify & treat foot problems & can prescribe corrective footwear & orthotics.
Assess for & manage postural hypotension		<ul style="list-style-type: none"> Check supine & standing blood pressure using 1-page protocol, <i>Measuring Orthostatic Blood Pressure</i>. Recommend medication changes to reduce hypotension. Monitor patient as he/she makes recommended changes. Counsel patient & give the brochure, <i>Postural Hypotension, What It Is and How to Manage It</i>.
Review & manage medications		<ul style="list-style-type: none"> Taper & stop psychoactive medications if there are no clear indications. Try to reduce doses of necessary psychoactive medications. Recommend changes to reduce psychoactive medications. Monitor patient as he/she makes recommended changes.
Increase vitamin D		<ul style="list-style-type: none"> Recommend at least 800 IU vitamin D supplement.
Assess visual acuity & optimize vision		<ul style="list-style-type: none"> Administer brief vision test. Refer to ophthalmologists or optometrists. <ul style="list-style-type: none"> These specialists can identify & treat medical conditions contributing to vision problems & address problems with visual acuity & contrast sensitivity.
Address home safety & how to reduce fall hazards		<ul style="list-style-type: none"> Counsel patient about reducing fall hazards. Give CDC brochure, <i>Check for Safety</i>. Refer to OT to assess safety & patient's ability to function in the home.
Educate about what causes falls & how to prevent them		<ul style="list-style-type: none"> Educate patient about fall prevention strategies. Give CDC brochure, <i>What YOU Can Do to Prevent Falls</i>. Recommend exercise or community fall prevention program.
Identify community exercise & fall prevention programs		<ul style="list-style-type: none"> Contact senior services providers & community organizations that provide exercise & fall prevention programs for seniors. Compile a resource list of available programs.



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APPENDIX 10

Preventing Falls in Older Adults' Tri-fold Provider Pocket Guide

Talking with your Patient about Falls

If you hear:	You can say:
Precontemplation Stage	
Falling is just a matter of bad luck.	As we age, falls are more likely for many reasons, including changes in our balance and how we walk.
Contemplation Stage	
My friend down the street fell and ended up in a nursing home.	Preventing falls can prevent broken hips & help you stay independent.
Preparation Stage	
I'm worried about falling. Do you think there's anything I can do to keep from falling?	Let's look at some factors that may make you likely to fall & talk about what you could do about one or two of them.
Action Stage	
I know a fall can be serious. What can I do to keep from falling and stay independent?	I'm going to fill out a referral form for a specialist who can help you improve your balance.



Preventing Falls in Older Patients Provider Pocket Guide

Key Facts about Falls:

- 1/3 of older adults (age 65+) fall each year.
- Many patients who have fallen do not talk about it.

This is What You Can Do:

RITUAL:

Review self-assessment brochure

Identify risk factors

Test gait & balance

Undertake multifactorial assessment

Apply interventions

Later, follow-up

Key Steps for Fall Prevention

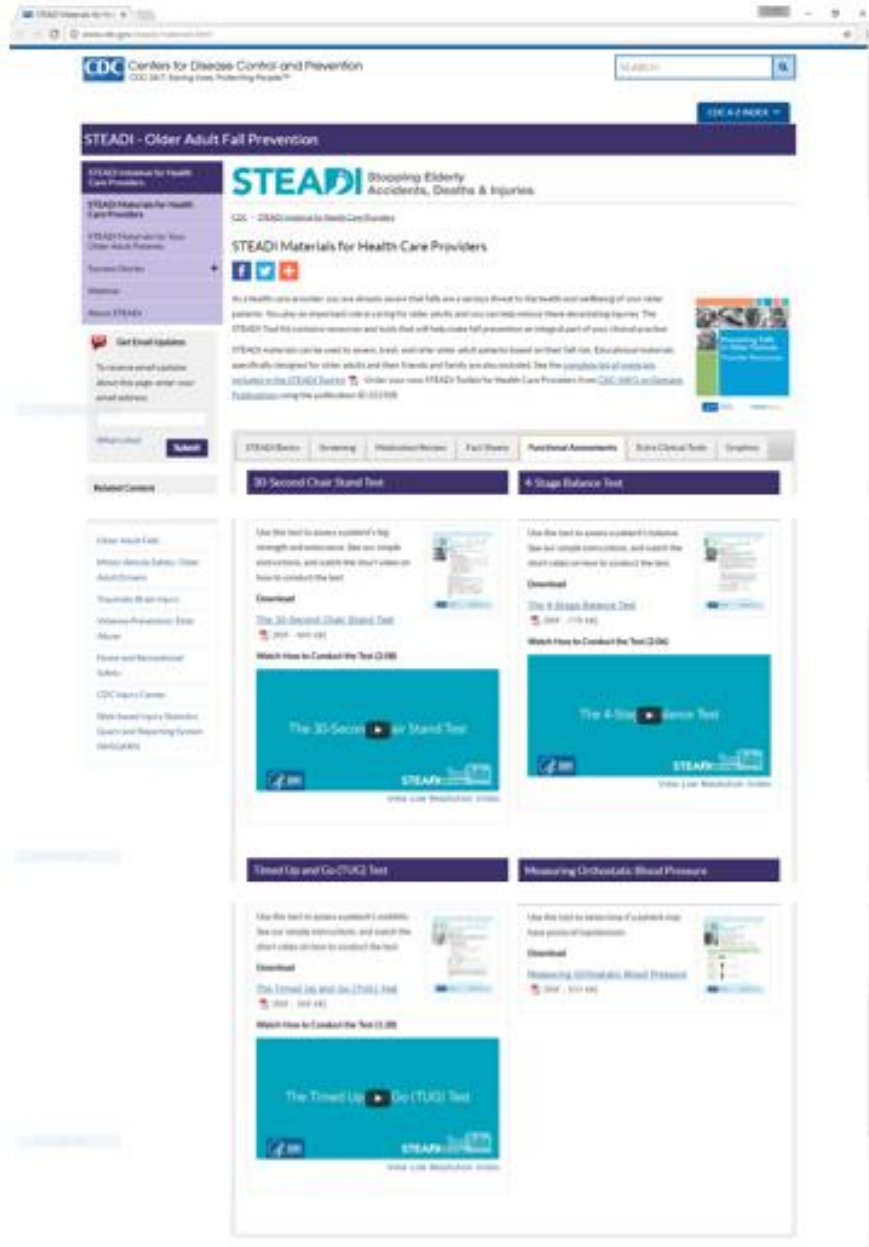
1. Be proactive—ask all patients 65+ if they've fallen in the past year.
2. Identify & address fall risk factors:
 - Lower body weakness
 - Gait and balance problems
 - Psychoactive medications
 - Postural dizziness
 - Poor vision
 - Problems with feet and/or shoes
 - Home safety
3. Refer as needed to specialists or community programs.
4. Follow-up with patient within 30 days.

Key Fall Interventions

- Educate patient
- Enhance strength & balance
- Modify medications
- Manage hypotension
- Supplement vitamin D +/- calcium
- Address foot problems
- Optimize vision
- Optimize home safety

APPENDIX 11

Screen shot of one of the STEADI toolkit for providers
Webpages: Functional Assessments
(downloadable pdf tests files and short video clips of test
administration)



APPENDIX 12

Flyers displayed at OLLI informing members of upcoming training seminars



To Learn More, Attend:

Preventing Falls at Home - An Interactive Training Seminar

Register today for a date that works best for you:

Thursday, September 3, 11:45 AM - 12:45 PM

Tuesday, September 8, 12:15 - 1:15 PM

Friday, September 18, 12:15 - 1:15 PM

Monday, September 21, 3:45 - 4:45 PM

Bring a brown bag if you wish to.

The graphics and scoring chart on this flyer have been derived from:



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Date created: May 25, 2015

APPENDIX 13

Course Description for the Free-of-Cost Fall Prevention Training Seminars (for Older Adults) offered at the Osher Lifelong Learning Institute during Fall 2015

Preventing Falls at Home: A FREE Interactive Seminar.

Presenter: Kshitija ("Kay") Kulkarni, a doctoral candidate from UTMB with more than 6 years of experience training older adults to be safe within their home environments.

Come learn simple measures you can take to reduce your risk of falling at home. Learning fall prevention techniques can go a long way to ensuring independence in one's home. Learn whether you are at risk of falling and how you can protect yourself.

Bring a brown bag if you wish to. Pre-registration required, space is limited.

The same seminar will be repeated on four dates in September.

Register today for the date that works best for you:

Thursday, September 3, 11:45 AM - 12:45 PM;

Tuesday, September 8, 12:15 - 1:15 PM;

Friday, September 8, 12:15 - 1:15 PM;

Monday, September 21, 3:45 - 4:45 PM.

Date created: June 3, 2015

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VITA

Kshitija Kulkarni was born on October 3, 1978 to Dr. Kranti Kulkarni and Ashok Kulkarni, in the city of Ahmednagar, state of Maharashtra, India. Kshitija completed her schooling up to junior college level (12th grade) in Ahmednagar through 1996. She completed her Bachelor of Science in Occupational Therapy from Government Medical College, Nagpur University, located in the city of Nagpur, Maharashtra, in the year 2000. Kshitija worked as an occupational therapist, in the city of Pune, Maharashtra, until June 2002 in the outpatient Hand and Neurorehabilitation Clinic, and the outpatient setting (for Children with Sensory Integration Disorders) and acute inpatient setting (for children and adults with neurological impairments) of the Pune Institute of Neurology. She also provided home health visits for her patients discharged from acute care (adults with Parkinson's disease, stroke; and children with medically fragile conditions such as hydrocephalus).

Kshitija came to United States in 2002 to pursue the Advanced Professional Master of Science degree program in Occupational Therapy at the State University of New York, Buffalo, NY. Since the completion of her MS in 2005 for 5 years (through 2009), Kshitija worked in Pittsburgh, PA and for a year-and-half (2010-2011) in Houston, TX, as an occupational therapist, with adult population in various clinical settings including acute hospitals, sub-acute and transitional care units, inpatient rehabilitation units, and skilled nursing and long-term care facilities. She moved to Houston, Texas from Pittsburgh, Pennsylvania in 2010, and worked as an occupational therapist at an inpatient rehabilitation

facility through 2011. Majority of Kshitiya's clinical experience in the United States has been with the geriatric/older adults population.

Kshitiya joined University of Texas Medical Branch, at Galveston, TX (UTMB), in Spring of 2012 in the doctoral program in Rehabilitation Science, at the Division of Rehabilitation Sciences. She enrolled in the Master of Public Health program, at the Department of Preventive Medicine and Community Health in Fall 2014. Kshitiya has graduated from her PhD in Rehabilitation Sciences and plans to graduate from her MPH programs in May 2017. While pursuing her doctoral studies Kshitiya also worked as an adjunct faculty/instructor in the Department of Occupational Therapy at UTMB.

Dr. Kshitiya Kulkarni is fondly known by the nick-name 'Kay' by family, friends and colleagues. She first met her husband, Dr. Amol Karmarkar, in 1996, in Nagpur, India. They got married in 2004 in Buffalo, NY. Their first child, Aarya Karmarkar, was born in Pittsburgh, PA, on October 12, 2009. Their second child, Parth Karmarkar, was born in Houston, TX, on December 12, 2011. Kshitiya, her husband, and their two children currently live in League City, Texas.