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Falls and Fall Protocols in the Care of Older Adults: A Comparison of Inpatient and Community Dwelling Veterans

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A Comparison of Inpatient and Community Dwelling Veterans

An Honors Thesis

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Abstract

Project Title: Falls and Fall Protocols in the Care of Older Adults: A Comparison of Inpatient and Community Dwelling Veterans
Background: There is currently no literature that compares fall risks and fall prevention protocols among community dwelling and institutionalized elderly veterans.
Objective: This research project aims to eliminate this literature gap by utilizing a retrospective descriptive design to analyze existing health records of veterans from the St. Cloud Veterans Administration Health Care System (VAHS).
Method: This purpose of this study was to compare fall risk factors for inpatients and outpatient veterans. A repeated measure, retrospective record review was used. Veterans 65 and over with ICD-9 codes for risk for falls were included in the sample. The study sample included 145 older veterans (65+) who received care in inpatient and outpatient settings associated with the St. Cloud VAHS and older veterans living in VA nursing homes or assisted living settings. The sample had ICD-9 codes for fall risk. Frequencies and chi-square analyses were used to address the research hypothesis.
Results: No significant differences were found in calculated fall risk between inpatient (institutionalized) and outpatient (community dwelling) veterans. No consistent documented fall risk or fall assessment protocols are currently being utilized at the research site; further research is required to analyze fall risk protocol utilization and clinical significance of fall risk scores among inpatient and outpatient veterans.

Falls and Fall Protocols in the Care of Older Adults:

A Comparison of Inpatient and Community Dwelling Veterans

Introduction

Every year, one in three adults age 65 and older falls. These falls can lead to severe injuries, such as hip fractures and head traumas, and can increase the risk of an early death. Fortunately, elderly falls are largely preventable (CDC, 2010).

Elderly falls are multifactorial in nature, and utilization of fall prevention protocols vary depending on the population. There is a significant knowledge gap in the research literature related to falls and fall prevention protocols for community living elderly veterans. Due to the growing incidence of in-home health care, focusing on community-based care has become pertinent.

Identifying variations in the utilization of fall risk assessments and fall prevention protocols between community-based and institutionalized health care holds future implications for health care practice and the possible reduction of fall risk and total incidence of falls in the elderly. Consistency in applying an effective fall-risk monitoring and fall-reduction protocol will allow for enhanced patient care, reduce health care costs and create an overall increase in the quality of life for the elderly (CDC, 2010).

Literature Review

The scientific literature on health issues of community dwelling older adults is limited. Major topics include fall risk factors and prevention (Anders, Dapp, Laub, & von Renteln-Kruse, 2007; Bath & Morgan, 1999; Da Silva Gama, & Gomez-Conesa (2008); French, Campbell, Spehar, Rubenstein, Branch, & Cunningham (2006); Inokuchi, Matsusaka, Hayashi, & Shindo (2007); Sai, Gallagher, Smith, & Logsdon (2010); Steinberg, Cartwright, Peel & Williams (2000); Stevens, Mack. Paulozzi & Ballestreros (2008).

Current literature in elderly fall risk and fall prevention highlights a number of themes: 1. fall risks are multifactorial, 2. interventions focus on exercise/strength/balance training, 3. the importance of timely fall reporting, 4. home environment assessment and modification, and 5. fall prevention activities related to polypharmacy and medications known to contribute to falls. A number of studies specified fear of falling and history of falls as significant to fall risk. Anders, Dapp, Laub, & von Renteln-Kruse (2007) found that a fall-risk screening instrument was useful and valid to predict risk of falling and functional decline in independently living senior citizens moving toward frailty. Fear of falling and symptoms of frailty were related to an increasing risk of falling and loss of mobility and autonomy. However the Anders et. al. study (2007) was done in Germany which may limit its generalizability in the USA because of cultural differences. Da Silva Gama & Gomez-Conesa (2008) identified in a systematic review of the literature that the main factors associated with an increased risk of falls include previous falls, altered gait, functional impairment, cognitive impairment, psychotropic medication use and excessive physical activity. Methodological limitations such as small sample size and ineffective control of extrinsic determinants were identified, as well as a need for further studies and closer monitoring during the follow-up period to help enhance the accuracy of fall-recall. This study too, was conducted with a European population, which may create limitations to its generalizability, especially for psychosocial factors. Sai, Gallagher, Smith, & Logsdon (2010) found that significant predictors of being a "faller" were a history of falls at baseline, depression, and timed rise (the time taken by a subject to rise from a chair as quickly as possible). Timed rise was the single most important test that was able to predict both a first time faller and a recurrent faller. However, the population was not randomly selected and thus a selection bias existed, reducing generalizability.

A few studies identified polypharmacy and central nervous system (CNS) medications as significant to fall risk. French, Campbell, Spehar, Rubenstein, Branch, & Cunningham (2006) determined that polypharmacy in community-dwelling elderly veterans is widespread and there is an increased risk of fractures correlated with prescribing central nervous system drugs. While the authors identified that fractures are typically due to falls and motor vehicle accidents, they did not identify the specific mechanism of injury of elderly fractures. Bath & Morgan (1999) found that prescribed medication, lower walking speed, and better health all significantly and independently, are associated with incident falls; they found a higher incidence among women, and increased incidence of falls with age. However, the longitudinal nature of the study contributed to an interval of at least 4 years between baseline measurements and thus decreased the accuracy of data results/interpretation.

A number of studies identified exercise as significant in preventing falls. Stevens, Mack. Paulozzi, Ballestreros (2008) stated that most effective interventions focus on exercise, medication management, vision correction, and home modifications. This self-report study had poor overall representativeness. Steinberg, Cartwright, Peel, & Williams (2000) proposed that effective, sustainable, low cost programs can be introduced through community-based organizations to reduce the incidence of slips, trips, and falls. The sample size of this study was small, which limits its generalizability. Inokuchi, Matsusaka, Hayashi, & Shindo (2007) proposed that an exercise intervention program significantly improved physical function and emotional status, and reduced the number of falls and risk factors for falls in community dwelling older adults. However, participants were not blind to the study and were asked to self-report falls, which can lead to inaccurate or incomplete data collection.

Much of the literature dealt with populations outside of the United States; this limits the utility of the findings for the current study. No literature was found that compared fall risks and

fall prevention protocols among community-dwelling elderly and institutionalized elderly veterans. This study aims to eliminate part of this gap in the literature. Identifying an effective fall-reduction protocol for community-dwelling and institutionalized older adults could allow for enhanced patient care, reduced health care costs, and an overall increase in the quality of life in the elderly (CDC, 2010).

Hypotheses

It is hypothesized that:

- there is no difference between fall risk among community dwelling elderly and institutionalized elderly veterans.
- there is no difference between fall risk/fall prevention protocols among community dwelling elderly and institutionalized elderly veterans.

Study Design & Methods

This study was a part of a larger repeated measures, retrospective, record review of veterans 65 and over with a ICD-9 codes for depression, alcohol use/abuse and/or risk for falls. The larger study, *Comparison of health and illness patterns of community-dwelling veterans with those living in institutional settings,* used existing medical record data extracted, electronically from inpatient and outpatient health records at the St. Cloud VAHS.

The preliminary study population in the larger study included older veterans (65+) who receive care in outpatient settings associated with the St. Cloud VAHS and older veterans living in VA nursing homes or assisted living settings. A preliminary screening of 1200 records achieved a sample of 743 veterans receiving/seeking care at the St. Cloud VAHS January 1, 2007-December 31, 2010. The preliminary data sample had ICD-9 codes for depression, alcohol use/abuse, and or fall risk. At the initial data point, the preliminary date sample included 98 veterans residing in institutionalized settings and 645 residing in non-institutional settings in the

Data Collection

Data collection methods were designed in cooperation with the Director of Research at the St. Cloud Veterans Administration Health Systems. Variables included were: demographic information (e.g. gender, race, marital status, combat experience, service-connected, and living arrangements; health/wellness variables (e.g. medical diagnoses, protocol driven assessment scores (e.g. PHQ-2, AUDC, fall risk); medications, for both residential patients within the medical center and those receiving care in the outpatient care setting.

Human subjects' protection

A number of protections are required for accessing personal health information (PHI) of veterans receiving health services from the VA. The primary and co-investigators participated in the extensive research training required by the VA. 'Request to review the research proposal' and 'application for initial review of medical records-only research' was submitted to the Institutional Review Board (IRB) and which determined that the proposal was exempt as the data were all retrospective. The primary and co-investigators followed the requirements of human subjects' protection throughout the research project. The student co-investigators did not have access to files containing raw data; they did have access to output following files following analysis.

Data Security

Only de-identified data was gathered into an Excel spreadsheet. The data were then imported into the PASW 17 computer software program for analysis. The purpose of the data was to conduct scientific research and no personnel involved identified, directly or indirectly, any individual patient in any report of such research or otherwise disclose patient or subject identities in any manner. Each subject was assigned a research number, after which identifiers were removed. A copy of the research codes linked to a unique identifier was kept at the St.

Cloud VAHS in a password-protected file. This is a precaution in case the electronic working file must be recreated due to data corruption or a computer failure. The de-identified working file(s) was stored in a password-protected drive that met VA security requirements and HIPPA guidelines. Any PHI collected did not leave the facility in any form and was secured when not directly supervised by one of the investigators. Upon completion of the study the data files were destroyed per VA retention policy. Once data was deemed to be discarded or destroyed electronic files were properly sanitized.

Statistical Analyses

Incidence and prevalence rates of medical and mental health ICD-9 and DSM-IV were established for the inpatient and outpatient subjects, respectively. The outcome variables denoting change were compared to data from the previous year(s). Descriptive statistics were calculated on all study variables using PASW 20. Chi-square was used for comparisons of categorical variables, and changes over time within each group and commonalities, and differences between the two groups.

The Present Study

Subset Methods

A smaller number of variables were chosen for the present study. The specific ICD-9 diagnosis codes for the present study (Appendix A) were examined in relation to the demographic variables and outcome variables. Additionally, the utilization of fall risk assessment protocols between inpatient and outpatient settings was examined. Table 1 identifies the variables of interest.

Table 1 Variables of interest

Inclusion Criteria	Exclusion Criteria	Demographic Variables	Outcome Variables
Random sample Aged ≥ 65 • inpatient (VAHS hospital, LTC or assisted living); • outpatient (community-dwelling) ICD-9 Diagnostic codes for fall risk (see Appendix A) Index Date: 1/1/07	• veterans < 65 years old • Veterans that do not have the diagnoses for fall risk.	• Age • Gender • Race • Marital Status • Combat experience (yes/no) • Service connected (yes/no) **Covariates-- g**athered –every Dec. 31 in 2007, 2008, 2009, 2010 • ICD-9 codes (co-morbidities) • Annual primary care visit screening scores for fall risk (from clinical reminder/notes)	Gathered –every 12 months through 12/31/10 • Extent of adherence to established care protocol(s) • Change in severity of illness (based on fall screening assessment scores) • Change in ICD-9 codes • Change in inpatient/outpatient status • Hospitalization date(s) • Death

Sample

The subsample, derived, from the larger study's preliminary database consisted of (n=63) inpatient and (n=82) outpatient. Total sample size was (n=145) total veterans.

Statistical Analysis

Frequencies and chi-square analyses were used to address the research hypothesis and other relationships among and between demographic variables and fall risk.

Results

There were no statistically significant differences between the inpatient (n=63) and outpatient (n=82) veteran groups for the majority of the demographic variables, including age, marital status, gender, race, or service connected veterans (See Tables 2-9). This shows comparability of the inpatient and outpatient group and good control of variables.

Table 2. Frequencies Age category by Group

		Group		
		1 (Count)	2 (Count)	Total
Age category	Missing		1	1
	1 65-69	15	11	26
	2 70-74	18	26	44
	3 75-79	16	19	35
	4 80-84	7	15	22
	5 over 84	7	10	17
Total		63	82	145

Table 3. Chi-Square Age Category by Group

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.571[a]	4	.467
Likelihood Ratio	3.591	4	.464
Linear-by-Linear Association	1.605	1	.205
N of Valid Cases	144		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.44.

Table 4. Frequencies Marital Status by Group

		Group		
		1 (Count)	2 (Count)	Total
Marital	Missing	0	1	1
	Divorced	23	15	38
	Married	22	47	69
	Never Married	5	4	9
	Separated	2	1	3
	Widowed	11	14	25
Total		63	82	145

Table 5 Chi-Square Marital Status by Group			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.233[a]	5	.069
Likelihood Ratio	10.666	5	.058
N of Valid Cases	145		
a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .43.			

Table 6. Frequencies Race and Group				
		Group		
		1 (Count)	2 (Count)	Total
Race	Missing	4	5	9
	American Indian Or Alaska Native	2	0	2
	Black, Not Of Hispanic Origin	1	0	1
	Hispanic, White	0	2	2
	Null	18	17	35
	White, Not Of Hispanic Origin	38	58	96
Total		63	82	145

Table 7. Chi-Square Race by Group			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.936[a]	5	.225
Likelihood Ratio	8.772	5	.119
N of Valid Cases	145		
a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .43.			

Table 8. Frequencies Service connected by Group				
		Group		
	Percents	1	2	Total
Level of Service Connection	Missing	4	9	13
	0.	4	3	7
	10.	6	11	17
	20.	0	4	4
	30.	3	2	5
	40.	2	2	4
	50.	1	1	2
	60.	1	4	5
	70.	3	4	7
	80.	3	1	4
	90.	1	2	3
	100	11	6	17
	NULL	24	33	57
Total		63	82	145

Table 9. Chi-Square Service connected by Group			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.614[a]	12	.477
Likelihood Ratio	13.236	12	.352
N of Valid Cases	145		
a. 18 cells (69.2%) have expected count less than 5. The minimum expected count is .87.			

A significant difference was found between the inpatient and outpatient veteran groups with ICD-9 codes for other/non-specified falls and history of falls for combat experience. Table 10 indicates that there were more combat-experienced veterans in the outpatient veteran group (group 2) than the inpatient veteran group (group 1). However, a majority of data (>50%) was missing as combat designation is not a required variable in the medical record. More research is needed to determine if this difference in combat experience was correlated to falls and fall risk.

Table 10. Frequencies Combat Experience by Group				
		Group		
		1	2	Total
combat	Missing	31	40	71
	No	31	31	62
	Yes	1	11	12
Total		63	82	145

Table 11 Combat Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.107[a]	2	.029
Likelihood Ratio	8.399	2	.015
N of Valid Cases	145		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.21.			

Additionally, no documented fall risk or fall assessment protocols are currently being utilized at the research site other than what might occur via the ICD-9 codes for fall risks. As such, correlations between fall assessment protocol utilization and incidence of falls based on ICD-9 fall diagnostic codes could not be assessed. Unfortunately, the lack of documentation made it difficult to definitively assess the fall risk among inpatient versus outpatient veterans. No Morse Fall Risk scores or other risk assessment scores were accessible in the data. Frequently, nursing fall risk assessments, diagnoses and interventions are based on use of the Morse Fall Scale (MFS) (Morse, 1997). The MFS is used widely in acute care settings, both in hospital and long-term care inpatient settings. The MFS requires systematic, reliable assessment of a patient's fall risk factors upon admission, the occurrence of a fall, a change in status, and at discharge or transfer to a new setting. Table 12 depicts MFS items and the scoring for each item. Scores are summed and a risk level (no risk, low risk, high risk) assigned.

Table 12. Morse Fall Risk Assessment

Risk Factor	Scale	Score
History of Falls	Yes	25
	No	0
Secondary Fall Diagnosis	Yes	15
	No	0
Ambulatory Aid	Furniture	30
	Crutches / Cane / Walker	15
	None / Bed Rest / Wheel Chair / Nurse	0
IV / Heparin Lock	Yes	20
	No	0
Gait / Transferring	Impaired	20
	Weak	10
	Normal / Bed Rest / Immobile	0
Mental Status	Forgets Limitations	15
	Oriented to Own Ability	0

Morse Fall Scale scores of 0-24 put the patient in a no risk category, and require no further action. Morse fall scale scores of 25-50 put the patient in a low risk category, at which time standard fall prevention interventions are implemented (Appendix B). Morse fall scale scores of 50 and above put the patient in a high risk category, at which time high risk fall prevention interventions are implemented (Appendix C).

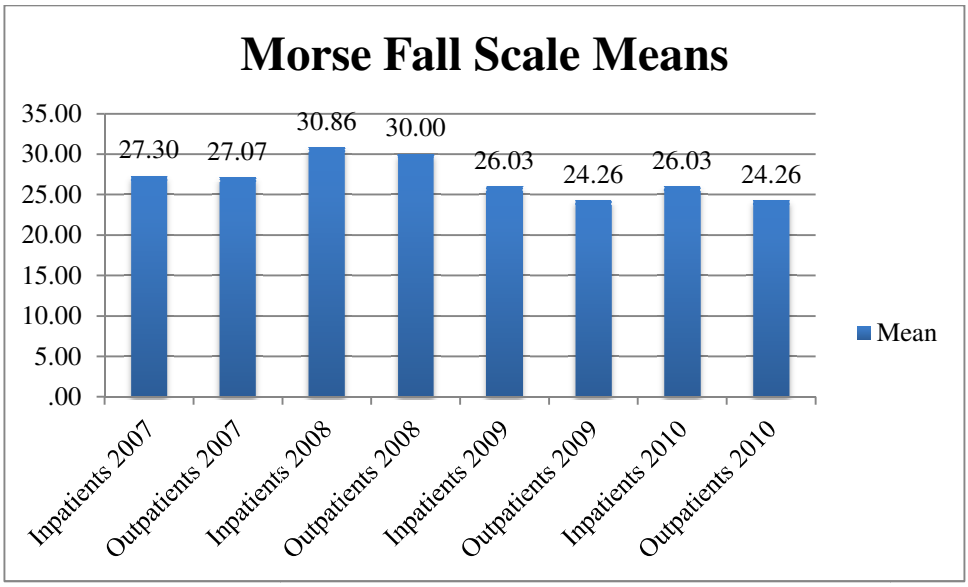
In the absence of fall risk protocols and ensuing Morse Fall Risk scores, a modified Morse Fall risk was manually assigned based on ICD-9 Codes corresponding to three of the six criteria: 1. History of falling (ICD-9 code V15.88) 2. Secondary diagnosis (any veteran with 2 or more ICD-9 fall codes), and 5. Gait/Transferring (ICD-9 code 781.2).

Table 13. and Chart 1 present the mean Modified Morse Fall Scale scores ranging from 24.26 to 30.86 between the years of 2007-2010. This indicates that the average veteran patient was in a low fall risk category.

Table 13. Modified Morse Fall Risk Score: Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
MF 07	Inpatients	63	27.30	14.559	1.834
	Outpatients	82	27.07	15.752	1.739
MF08	Inpatients	29	30.86	15.815	2.937
	Outpatients	34	30.00	16.049	2.752
MF09	Inpatients	29	26.03	19.428	3.608
	Outpatients	34	24.26	20.491	3.514
MF10	Inpatients	29	26.03	19.428	3.608
	Outpatients	34	24.26	20.491	3.514

Chart 1: Morse Fall Scale Means



As shown in Table 14, there were no significant differences found in the T-test comparing fall risk of inpatient and outpatient veterans during 2007-2010. Further research using documented versus calculated MFS scores is needed to determine clinical significance of fall risk between inpatient and outpatient veterans.

Table 14 Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
MF07	Equal variances assumed	.263	.609	.089	143	.929	.228	2.554	-4.821	5.277
	Equal variances not assumed			.090	138.14	.928	.228	2.528	-4.770	5.227
MF08	Equal variances assumed	.036	.850	.214	61	.831	.862	4.030	-7.196	8.920
	Equal variances not assumed			.214	59.70	.831	.862	4.025	-7.190	8.914
MF09	Equal variances assumed	.159	.691	.350	61	.728	1.770	5.058	-8.345	11.884
	Equal variances not assumed			.351	60.28	.727	1.770	5.036	-8.304	11.843
MF10	Equal variances assumed	.159	.691	.350	61	.728	1.770	5.058	-8.345	11.884
	E.v. not assumed			.351	60.28	.727	1.770	5.036	-8.304	11.843

Discussion

There were a fair number of limitations in this study. Sample size was limited (n=145) due to the specific nature of the population studied and exclusion criteria. The sample was male-only and geographically constrained to Central Minnesota. This created an inherent limitation in the generalizability of the data. Several methodological limitations of this study were identified, including incorrect or missing ICD-9 codes, unevenness in the extraction of data, and limited accessibility to the data. There also is no current ICD-9 code specifically assigned to a “Fall” event; this creates an inherent difficulty in assessing incidence of falls. One limitation of the outpatient veteran incidence of falls is that self-reporting on falls of patients in the community

may not be very reliable. Additionally, the lack of utilization of fall risk and fall assessment protocols created a limitation in the generalizability of the data; it is not possible to accurately ascertain fall risk without a universal method or protocol.

For the purposes of this study, modified Morse Fall Scale scores were generated using half of the criteria in a normal MFS; this created a way to compare inpatient and outpatient veteran data, yet there was no way to test the reliability and validity of this method. This limitation was compounded by a lack of information on healthcare providers and the methodology they used to assign ICD-9 fall codes to veteran patients. These limitations suggest an inherent system issue that could be contributing to further incidence of falls among the veteran population.

Recommendations

Future research is needed in the area of fall risk/fall assessment protocols to determine a significant correlation between fall assessment protocol utilization and incidence of falls based on ICD-9 fall diagnostic codes or a standardized fall risk assessment instrument. Many hospitals have developed and currently utilize a fall prevention program to decrease risk of falls and fall-related injuries. According to Morse (1997), the first step in decreasing a patient's risk for falls and fall-related injuries is by profiling that individuals' level of fall risk. This risk profiling requires consistent application of a valid, reliable fall risk assessment tool that identifies patients at risk. Once patients at risk for falls are identified with use of the standard fall risk assessment tool, the healthcare team could incorporate patient-specific fall prevention interventions into the plan of care. Additionally, pulling data from a variety of hospital electronic medical records would enhance the study population and reduce limitations in data accessibility.

Incidence of falls and adherence to fall risk/fall assessment protocols has major implications for nursing education. Implementing an effective fall risk assessment can help to

reduce overall risk for and incidence of falls in the elderly; this enhances patient care, reduces health care costs and results in an overall increase in their quality of life (CDC, 2010). Furthermore, receiving proper education on fall risk will help nurses to be proactive and provide preventative interventions versus treatment post-fall. Additionally, this topic has implications for nursing preparatory schools; as the demographic of patient populations increasingly is shifting towards the elderly population, this issue is especially pertinent.

Ultimately, a large body of research is required to effect a change in practice. Having accurate ICD-9 codes assigned to patients as well as implementing a standardized, reliable and valid fall assessment protocol would certainly be a baseline requirement for the necessary research to be successfully conducted. The issue of falls and fall prevention is not limited to the veteran population; rather, it spans the entire geriatric populace. For this reason, investing in research that addresses falls and fall prevention is not only worthwhile—it is quite necessary.

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Appendix A

ICD-9 Fall Codes		
Code	Code Label	Code Definition
780.2	Syncope and Collapse	Fainting due to a sudden fall of blood pressure below the level required to maintain oxygenation of brain tissue, extremely weak; threatened with syncope, and a spontaneous loss of consciousness caused by insufficient blood to the brain.
780.4	Dizziness and Giddiness	illusory sense that either the environment or one's own body is revolving; may result from disease of the inner ear or disturbances of the vestibular centers or pathways and vertigo is a feeling of movement, a sensation as if the external world were revolving around the patient (objective vertigo) or as if he himself were revolving in space (subjective vertigo). Vertigo is medically distinct from dizziness, lightheadedness, and unsteadiness.
781.0	Abnormal Involuntary Movements	A sudden, violent, involuntary contraction of a muscle or a group of muscles, attended by pain and interference with function, producing involuntary movement and distortion, a sudden, violent, involuntary contraction of a muscle or group of muscles, involuntary trembling or quivering, the shaking movement of the whole body or just a certain part of it, often caused by problems of the neurons responsible for muscle action and dyskinesia due to extrapyramidal disorder; as a general rule, symptoms are absent during sleep, reduced with relaxation, and increased with stress
781.2	Abnormal Gait	Awkward, uncoordinated walking
781.4	Lack of Coordination	Awkwardness in motor behavior associated with loss of afferent information from the moving part or with loss of control mechanism of the cerebellum, loss of muscle coordination, and loss of coordination of voluntary muscular movement
V15.88	History of Falls	A personal history of fall, and increased susceptibility to falling that may cause physical harm
E888.8	Other Fall	Other or unspecified falls due to slipping or tripping which result in loss or injury
E888.9	Unspecified Fall	
332	Parkinson's Disease	A progressive, degenerative disorder of the nervous system characterized by tremors, rigidity, bradykinesia, postural instability, and gait abnormalities; caused by a loss of neurons and a decrease of dopamine in the basal ganglia, a progressive disorder of the nervous system marked by muscle tremors, muscle rigidity, decreased mobility, stooped posture, slow voluntary movements, and a mask-like facial expression, and a disease characterized as a progressive motor disability manifested by tremors, shaking, muscular rigidity, and lack of postural reflexes.

Appendix B

Standard Fall Prevention Interventions

Direct Care Nursing Staff will:

- assess patient's fall risk upon admission,
- change in status, transfer to another unit and discharge,
- assign the patient to a bed that enables the patient to exit toward his/her stronger side whenever possible,
- assess the patient's coordination and balance before assisting with transfer and mobility activities,
- implement bowel and bladder programs to decrease urgency and incontinence, and use treaded socks for all patients.
- All Staff will approach patient towards unaffected side to maximize participation in care, and transfer the patient towards their stronger side.

Education provided will be the following:

- Actively engage patient and family in all aspects of Fall Prevention Program,
- instruct patient in all activities prior to initiating assistive devices, teach patient use of grab bars, and
- instruct patient in medication time/dose, side effects, and interactions with food/medications.

When Equipment is used, staff will

- ensure to lock all moveable equipment before transferring patients and individualize equipment specific to patient needs.

To ensure a safe Environment,

- staff will place patient care articles within reach,
- provide a physically safe environment (eliminate spills, clutter, electrical cords, and unnecessary equipment),
- provide adequate lighting.

Medical staff will

- evaluate and treat gait changes, postural instability, spasticity.
- initiate treatment for impaired vision/hearing,
- evaluate medication profile for fall risk,
- evaluate and treat pain,
- evaluate and treat orthostatic hypotension, and
- assess and treat impaired central processing (dementia, delirium, stroke, perception)

(US Dept. of Veterans Affairs, 2009).

Appendix C

High Risk Fall Prevention Interventions

Nursing Staff will:

- consider use of technology for fall prevention, such as a non-skid floor mat and raised edge mattress
- clear patient environment of all hazards.

Medical Staff will

- review medications for fall risk and adjust as indicated: CV agents - if orthostatic (drop in systolic > 20 mm in 3 minutes) and symptomatic,
- discontinue HCTZ,
- liberalize sodium in diet, if ACE inhibitor appropriate, use agent with less renal metabolism (fosinopril), if Calcium channel blocker - NOT nifedipine, if ß blocker - **not** cardioselective / not metoprolol / atenolol; use pindolol / propranolol,
- consider referral to services such as physical medicine and rehabilitation, audiology, ophthalmology, and cardiology,
- optimize treatment of underlying medical conditions,
- evaluate and treat for pain, and
- evaluate circumstances surrounding fall for extrinsic and intrinsic contributing factors.

All staff will

- provide education about exercise, nutrition, home safety, and formulating a plan for emergency fall notification procedure

(US Dept. of Veterans Affairs, 2009)