

Using Multifactorial Interventions to Prevent  
Elderly Hospitalized Patients with Mental Health Disorders from Falling

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### Abstract

Patients have ethical and legal rights to expect their environment is safe when they are hospitalized. A component of environmental safety is the duty of hospitals to anticipate the occurrence of patient falls and make reasonable efforts to prevent them. Falls during hospitalization radically increase physical, mental, and practical costs for patients, caregivers and hospitals. Elderly hospitalized patients with mental health disorders present a particularly difficult challenge for prevention advocates. This writer introduces a newly developed fall risk assessment tool called the Fall Geriatric Assessment and Intervention Tool (FALL GAIT). The FALL GAIT links patient fall risk factors with evidence-based multifactorial interventions for inclusion on patient treatment plans. The FALL GAIT may prove to be a valuable tool for reducing the rates of falls for elderly hospitalized patients with mental health disorders.

## Introduction

Falls involving elderly patients with mental health disorders correlate with greater health care costs compared to the general population of elderly patients (Bunn, et al., 2014). Falls are associated with (a) physical disability and a loss of confidence with respect to mobility, (b) an increased length of hospital stay with the associated treatment costs, and (c) a high probability of discharge to a long-term care facility (Titler, Shever, Kanak, Picone, & Qin, 2011). Roughly 35% of patients who fall incur physical harm, including death (Vieira, Freund-Heritage, & da Costa, 2011). The median additional treatment cost for patients injured in falls is \$17,483, not including personal costs such as lost wages (Agency for Health Care Research and Quality, 2010). In October, 2008, the Centers for Medicare & Medicaid Services (CMS) terminated payments for treatment caused by nosocomial falls (Titler, et al., 2011). Cochrane reviews provide evidence that multifactorial interventions are effective in preventing falls among hospitalized geriatric patients (Bunn, et al., 2014). The FALL GAIT lists current evidence-based factors, categorized by patient personal characteristics and clinical states, and links these to etiology-specific multifactorial fall deterrent interventions. The assessment findings and interventions are integrated immediately into the patient's plan of care. The Patient Fall & Classification Outcome Measure is used in conjunction with the FALL GAIT for outcomes measurement.

### **Personal Characteristics and Clinical States that Generate Patient Falls**

#### **Patient Personal Characteristics**

Patients aged 65 years and older experience the majority of nosocomial falls (NICE, 2013). Patients within this age group should be classified as fall risks at all times (NICE, 2013). The risk of falling increases in direct proportion to the number of identified fall risk factors

(Titler, et al., 2011). Every health care provider should be trained in fall risk assessment and fall prevention (Bunn, et al., 2014). Health care providers should conduct bi-weekly fall risk assessments on patients at risk for falls, or when physical, cognitive or psychological changes in patient condition are revealed (Vieira, et al., 2012). Patients who have fallen previously, who wear unsafe footwear, or who have an unsteady gait or a decreased level of independence are more predisposed to falling (Heslop, et al., 2012). Health care providers must consistently communicate a patient's mobility status among themselves, and examine mobility equipment regularly for safety and efficacy (Vieira, et al., 2012). Footwear should be resistant to slips, and health care providers must be continually observant to maintain dry, unobstructed floors and walkways (Vieira, et al., 2012). Patients at high risk for falling should have shower chairs placed into their bathrooms (Heslop, et al., 2012). Patients with low levels of independence should be assessed using a TUG test at the time of admission to determine the level of ambulation skill (Vieira, et al., 2012). Mobility-impaired patients should be assessed for occupational and physical therapy (Heslop, et al., 2012). Fall deterrent measures should include physical activity, and exercise to increase strength and improve balance (Heslop, et al., 2012).

### **Patient Clinical States**

Patients with mental health disorders, including dementia, cognitive impairment, depression, mania, anxiety, sleep disturbance, delirium, and fear of falling, are predisposed to falls (Bunn, et al., 2014; Vieira, et al., 2011). These patients should receive heightened supervision and frequent environmental reorientation (Heslop, et al., 2012). Placing the highest risk patients into a single group with intensified day and evening shift supervision can decrease falls (Detweiler, Kim, & Taylor, 2005). The use of sitters is a cost-effective fall deterrence intervention (Tzeng & Yin, 2008). The use of fall alarms for patients confined to chairs prevents

falls. Health care providers must observe for patients who will push other patients off balance (Vieira, et al., 2012). Placing pictures of toilet facilities onto bathroom doors can prevent falls caused by disorientation (Vieira, et al., 2012). Cognitive-impaired patients should be instructed regularly regarding the way to use the call system (NICE, 2013). Patients receiving opioids, benzodiazepines, tricyclic antidepressants, anti-diarrheal medications, oral hypoglycemic medications, three or more psychotropic medications, and electroconvulsive therapy likewise incur a greater number of falls (Bunn, et al., 2014; Titler, et al., 2011). Patients with fall risk caused by medication anomalies should receive frequent medical evaluations assessing the need to withdraw, change, or reduce medications (Bunn, et al., 2014). Falls are elevated in patients with urinary frequency or incontinence, postural hypotension, visual impairment, hypoglycemia, congestive heart failure, atrial fibrillation, hypertension, Parkinson's Disease, COPD, oxygen use, urinary catheter presence, joint replacements, osteoporosis, arthritis, cataracts, and glaucoma (Heslop, et al., 2012; Vieira, et al., 2012). Patients with these conditions should receive fall risk assessments more frequently (Heslop, et al., 2012). Patients with postural hypotension should receive orthostatic blood pressure tests over a minimum of three continuous days (Heslop, et al., 2012). Hypoglycemia caused by lack of food and fluid intake may cause dizziness or syncope (Detweiler, et al., 2005). Many elderly patients experience post-prandial hypotension lasting 30-60 minutes (Detweiler, et al., 2005). Vital signs should be taken after each meal. Patients with any degree of vision impairment should receive a vision examination (Heslop, et al., 2012).

**Fall Geriatric Assessment and Intervention Tool  
(FALL GAIT) ©JRGiancola**

Directions:

Circle each patient fall risk factor in the first column.

The presence of any **general** fall risk factor requires all seven treatment plan interventions.

For **specific** fall risk factors, circle each applicable treatment plan intervention in the second column.

| GENERAL FALL RISK FACTORS   | INTERVENTIONS (All are mandatory)                |
|---|--|
| Patient is aged 65 or older   | Patient is automatically classified a fall risk  |
| After admission, patient has experienced a change in physical, cognitive, or psychological status | Conduct a bi-weekly fall risk assessment         |
| Patient has fallen previously   | Take vital signs after each meal                 |
| Patient has an unsteady gait  | Place a shower chair in patient's bathroom       |
| Patient's independence level is decreased   | Provide patient with heightened scrutiny         |
|   | Perform a TUG Test on admission and bi-weekly    |
|   | Instruct patient on fall precautions every shift |
|   | Intervention: _____                              |
|   | Intervention: _____                              |

| SPECIFIC FALL RISK FACTORS                                      | INTERVENTIONS (Select appropriate)  |
|---|---|
| Patient has an unsteady gait or decreased level of independence | Ask physician to evaluate for physical therapy  |
|   | Ask physician to evaluate for occupational therapy                                      |
|   | Provide patient with regular physical activity to increase strength and improve balance |
| Patient has unsafe footwear                                     | Provide patient with non-slip footwear  |
| Patient has a mental health disorder                            | Reorient patient to the environment frequently  |

|  |   |
|--|---|
| <p>Patient is confined to a wheelchair</p> <p>Patient receives opioids, three or more psychotropic medications, anti-diarrheal medications, oral hypoglycemic medications, or ECT</p> <p>Patient has urinary frequency, urinary or bowel incontinence, postural hypotension, vision impairment, hypoglycemia, CHF, atrial fibrillation, hypertension, Parkinson's Disease, COPD, oxygen use, urinary catheter, joint replacement, osteoporosis, arthritis, cataracts, or glaucoma</p> <p>Patient has postural hypotension</p> <p>Patient has a vision impairment</p> | <p>Place patient in a small high-risk group for intensive observation day and evening shifts, including activity therapy</p> <p>Ask physician to order a sitter for patient</p> <p>Observe patient for behavior that is aggressive to other patients</p> <p>Place a picture of toilet facilities on patient's bathroom door</p> <p>Instruct patient regularly how to use the staff call system</p> <p>Fit patient with a fall alarm</p> <p>Ask physician to assess patient for withdrawal, change, or reduction of medications</p> <p>Assess patient for fall risk more frequently:<br/> Number of times per day _____<br/> Number of days per week _____</p> <p>Do orthostatic blood pressures every shift for three consecutive days</p> <p>Ask physician to evaluate for a vision examination</p> <p>Intervention _____</p> <p>Intervention: _____</p> |
|--|---|

Assessment conducted by: \_\_\_\_\_

Interventions added to patient's treatment plan: Yes No

Date: \_\_\_\_\_

## Patient Fall &amp; Classification Outcome Measure ©JRGiancola

**A patient who unintentionally descends to the floor experiences a fall. A patient discovered on the floor, who is unable to explain the reason for descent, is assumed to have fallen.**

**Patient Name:** \_\_\_\_\_ **Age:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## Classification of Fall Precipitant

## Personal &amp; Environmental Factors

Age ☐ Previous Inpatient Fall ☐  
 Decreased Level of Independence ☐  
 Unsafe Footwear ☐  
 Recent Change Increased Fall Risk ☒  
 Unsteady Gait ☒  
 Lighting ☐  
 Floor Obstacle or Wet ☐  
 Pushed by Another ☐  
 Multiple Fall Risk Factors ☐  
 Absence of Shower Chair ☐

## Clinical State Factors

Mental Health Disorder \_\_\_\_\_  
 Medication Anomaly \_\_\_\_\_  
 Medical Disorder \_\_\_\_\_  
 Hypotension ☐  
 Hypoglycemia ☐  
 Incontinence ☐  
 Unknown Precipitant ☒

## Description of Fall Incident

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## Subsequent Interventions

MD Notified ☐ Classified as Fall Risk ☐ Frequent Fall Risk Assessments ☐  
 Safe Footwear ☐ Secure Floor Condition ☐ Secure Lighting ☐ Shower Chair ☐  
 Tug Test ☐ OT ☐ PT ☐ Increased Observation ☐ Frequent Orientation ☐  
 Group Supervision ☐ Sitter ☐ Visual Aids ☐ Fall Alarm ☐ Medication Change ☐  
 Orthostatic BP Three Days ☐ Post-Prandial Vital Signs ☐ Vision Examination ☐

**Reporter** \_\_\_\_\_ **Witness** \_\_\_\_\_ **Date** \_\_\_\_\_



### **Analyses of Primary Research Support**

The authors (Bunn, et al., 2014) conduct a systematic review entitled “Preventing Falls among Older People with Mental Health Problems: A Systematic Review” using 21 articles published between 1997 and 2013 (Bunn, et al., 2014). The purpose is to evaluate the efficacy of interventions designed to deter falls in elderly patients with mental health disorders residing in a variety of settings (Bunn, et al., 2014). Seventeen included studies involved either controlled evaluations or randomized controlled trials (RCT) (Bunn, et al., 2014). Four studies were uncontrolled, and create an increased risk of bias because there was no control group (Bunn, et al., 2014). No qualitative studies were included (Bunn, et al., 2014). Controlled studies were assessed with the Cochrane Collaboration risk of bias tool (Bunn, et al., 2014). The evidence contained in this systematic review is not robust, but with 81% of the studies involving controlled methodology, the internal validity is strong (Bunn, et al., 2014). Seven studies included participants with and without mental health disorders (Bunn, et al., 2014). The relationships identified among the 21 research studies are not vigorously generalizable across populations and settings (Bunn, et al., 2014). However, the conclusion is sufficiently extensive to warrant a judgment that this systematic review possesses adequate external validity. The authors conclude that multifactorial interventions for the purpose of deterring falls are applicable to elderly patients with mental health disorders (Bunn, et al., 2014). The findings are interpreted thoroughly, with every possible study weakness identified.

The author (Agency for Health Care Research and Quality, 2010) (AHRQ) systematically reviews research studies conducted by the Oregon Evidence-based Practice Center under contract to the AHRQ. The purpose of “Interventions to Prevent Falls in Older Adults: An Updated Systematic Review” is to evaluate any benefits and detriments caused by assorted

interventions designed to reduce falls and improve the health outcomes of elderly patients in primary care settings (Agency for Health Care Research and Quality, 2010). The author selects randomized clinical trials that meet inclusion criteria established by the U.S. Preventive Services Task Force (USPSTF) and also report falls outcomes (Agency for Health Care Research and Quality, 2010). The author abstracts data and catalogues it into evidence tables, which are examined by an additional researcher (Agency for Health Care Research and Quality, 2010). Two researchers also evaluate every study against USPSTF criteria for trials (Agency for Health Care Research and Quality, 2010). The author conducts a broad array of statistical analyses to minimize any bias, including the standard chi-square tests, the  $I^2$  statistic, meta-analysis, and a risk ratio and its standard error. The author makes no specific statement regarding external validity. However, the author states: “Available studies do not clarify the best way to identify higher risk community-dwelling older adults for evidence-based interventions due to heterogeneity in tested approaches” (Agency for Health Care Research and Quality, 2010, p. iii). The author concludes that a number of variable fall interventions do in fact reduce falls among elderly hospitalized patients.

The authors (Heslop, et al., 2012) conduct a systematic review of nonrandomized trials entitled “Assessing Falls Risk in Older Adult Mental Health Patients: A Western Australian Review.” They evaluate the outcomes from using the Falls Risk Management Tool (FRMT) *versus* the Falls Risk Assessment Tool (FRAT) at two Older Adult Mental Health Services (OAMHS) sites in Western Australia, Australia (Heslop, et al., 2012). Descriptive statistics are not explained, but are employed to analyze demographic data (Heslop, et al., 2012). An  $\chi^2$  analysis identifies whether there was a statistical difference in factors between the two sites (Heslop, et al., 2012). Both the settings and the participants are representative of those for

proposed generalization (Heslop, et al., 2012). The study concludes that no differences in the patient population can account for the greater incidence of falls at Site 1 (Heslop, et al., 2012). However, the study recognizes that Site 1 patients may have a greater severity of symptoms because of their involuntary statuses (Heslop, et al., 2012). The authors conclude the FRAT and FRMT interventions “are more appropriate to the general health-care setting, and do not easily translate to acute inpatient mental health units” (Heslop, et al., 2012, p. 573).

The authors (Neyens, et al., 2009) conduct a randomized controlled trial entitled “A Multifactorial Intervention for the Prevention of Falls in Psychogeriatric Nursing Home Patients, a Randomised Controlled Trial (RCT).” The purpose is to evaluate the efficacy of a multifactorial fall deterrent intervention program, which the authors developed and implemented on psychogeriatric units in 12 nursing homes (Neyens, et al., 2009). The design is an RCT (Neyens, et al., 2009). The authors provided oral and written instructions regarding the intervention program and data collection only to the intervention group (Neyens, et al., 2009). A power analysis established the minimal sample size at 180 participants per group (Neyens, et al., 2009). The authors analyzed data using “multilevel Poisson regression” (Neyens, et al., 2009, p. 196). They also used the intention-to-treat principle (Neyens, et al., 2009). The authors admit the external validity is questionable because they may have unintentionally selected the most highly motivated nursing homes for inclusion in the sample (Neyens, et al., 2009). However, the selection procedure is explained and appears extremely random (Polit & Beck, 2012). The findings show the intervention program produced a statistically significant fall deterrent effect (Neyens, et al., 2009). The authors note the findings are consistent with several prior studies (Neyens, et al., 2009). The recommendations to implement the intervention program in residential homes and hospital settings are reasonable (Polit & Beck, 2012).

The authors (Titler, Shever, Kanak, Picone, & Qin, 2011) conduct an outcomes effectiveness study entitled “Factors Associated with Falls during Hospitalization in an Older Adult Population.” The purpose is to examine variables correlating with falls of elderly patients while hospitalized (Titler, et al., 2011). The study identified two independent variables-“patient characteristics and clinical conditions”-two intervening variables-“nursing unit characteristics and interventions”-and one dependent variable-“the occurrence of a fall at any time while hospitalized” (Titler, et al., 2011, pp. 127, 129). The authors gathered data from nine clinical and administrative data repositories belonging to one tertiary care hospital (Titler, et al., 2011). The sample population and the setting reflect those to which the results were designed to be generalized (Titler, et al., 2011). The authors note that the study’s generalizability is limited because the data were gathered from only one hospital, and the study design is observational (Titler, et al., 2011). The authors conclude outcomes effectiveness studies are important sources for evidence-based practice (Titler, et al., 2011). The study contributes considerable evidence to support the use of specific nursing interventions to deter falls (Polit & Beck, 2012).

The authors (Vieira, et al., 2012) conduct a controlled clinical trial entitled “Reducing Falls among Geriatric Rehabilitation Patients: A Controlled Clinical Trial.” The purpose is to test the efficacy of a fall deterrence intervention program which the authors developed (Vieira, et al., 2012). The study is a controlled clinical trial involving 76 pairs of matched patients on two hospital units, one the control ward and the other the intervention ward (Vieira, et al., 2012). The intervention was not provided to the control ward (Vieira, et al., 2012). The clinical educator provided education regarding the study and the intervention to only the staff on the intervention ward (Vieira, et al., 2012). Falls were recorded on NetSAFE, and reviewed to determine the number of falls per 1,000 patient days, and the circumstances surrounding each fall

that occurred from January, 2006 through December, 2008 (Vieira, et al., 2012). The authors admit the generalizability of the findings needs to be further evaluated (Vieira, et al., 2012). This contention is based upon the fact that personnel in the intervention ward had been involved in the project (Vieira, et al., 2012). The authors conclude that patients on the intervention ward experienced decreased rates of falls and a reduced percentage of fallers (Vieira, et al., 2012). They discuss three limitations of the study (Vieira, et al., 2012).

### **Conclusion**

This author introduces a new fall deterrent tool for use in inpatient settings called the FALL GAIT. Use of the FALL GAIT upon admission of elderly patients with mental health disorders, and at any appropriate time thereafter, may reduce the rates of inpatient falls among this population. This fall prevention strategy is supported by current best research evidence. The author also provides a comprehensive tool for fall prevention outcomes measurement. Further study is indicated regarding the efficacy of the FALL GAIT for fall risk assessment and fall prevention among elderly patients with mental health disorders.

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