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# The Relationship of Patient Falls to Prevention Policies in Hospitals: A Case Study

Cornelia Branzan

*MPA Program, Pace University*

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THE RELATIONSHIP OF PATIENT FALLS TO PREVENTION POLICIES IN  
HOSPITALS: A CASE STUDY

BY

CORNELIA BRANZAN

SUBMITTED IN PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE DEGREE  
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## Chapter I

### Introduction

There have been a lot of studies over the past decade on patient falls, risk factors, and strategies for preventing the falls. However, these studies provide answers for long term care; acute care and community hospitals need more specific interventions. Falls and their consequences are important for patients and families, health care providers, insurance companies, state agencies, hospital accreditation, and others. Furthermore, they are causing psychological and physiological injuries among the patients, take a greater time to recover, prolong hospitalization [15 days in Switzerland, Sweden, USA, Western Australia, Province of British Columbia and Quebec in Canada [www.stopfalls.com](http://www.stopfalls.com) )] and increase the health care costs. The advancement of the technology in the last few years can have a significant influence on improving the quality of care. The advantage is an increasing longevity of the population which on the other side comes with specific health issues. Sooner than expected, health care facilities will be confronted to meet the baby boomer wave and an aging population needs. Due to hospital closures and shortage of qualified nurses meeting these needs will impose even a greater pressure on delivering quality services with negative effects on efficiency of the health care system as a whole.

This study will examine the patient falls and the compliance with the fall prevention policy at The Mount Vernon Hospital. Specifically, the research will attempt to identify the patients at risk of falling, to evaluate the plan of care instituted by the nursing staff in order to prevent falls from happening, and the compliance of the nursing

staff with the existing policy/procedure. Data will be gathered to analyze the following questions:

1. What are the factors that trigger falls?
2. What is the hospital's fall prevention policy toward interventions to prevent falls from occurring?
3. How well is the hospital staff complying with the fall prevention policy?
4. How effective has health policy interventions been in reducing hospital falls?

In order to understand the issues related to patient falls and health policy the concepts should be defined. “**Falls** are commonly defined as inadvertently coming to rest on the ground, floor or other lower level, excluding change in position to rest in furniture, wall or other objects” ([www.stopfalls.org](http://www.stopfalls.org)). According to Morse, **fall risk assessment** is a type of tool available to assist in identifying the patient who falls. This tool consists “of some form of environmental checks (such as bed in the low position), patient behaviors (patient gait, confusion), nursing care strategies ...possible problems in the medical regimen (number of medications), and prevention strategies” (Morse, 1997, p. 38).

The hypothesis to be analyzed is that there will be a correlation between number of patient falls and compliance with the health policy. We assume that there are differences among hospital units regarding the number of patients at risk of falling due to patient's age, health conditions and the side effects of medications. This case will attempt to evaluate and analyze the existing risk assessment tool and the plan of care instituted by the nursing staff in order to prevent falls from occurring.

## Chapter II

### Review of the Literature

Falls, causes of fall, fall rates, and fall prevention programs have been a topic of interest in the literature for the last years. The World Health Organization's report on falls prevention in older age emphasizes on the magnitude of falls at the global level.

Approximately 28-35% of people aged of 65 and over fall each year increasing to 32-42% for those over 70 years of age .... The incidence of falls appears to vary among countries as well. For instance, a study found that in China, 6-31% of older adults fell each year, while another, found that in Japan, 20% of elderly fell each year. A study in the Latin/Caribbean region found that the proportion of older adults who fell each year ranging from 21.6% in Barbados to 34% in Chile ([www.stopfalls.org](http://www.stopfalls.org)).

Falls, causes of fall, fall rates, and fall prevention programs have been a topic of interest in the literature for the last years. According to Morse (1997, p. 2), falls are the second leading cause of death in the United States; 75% of them occur in elderly population. Fall fatality rate for people aged 65 and older in United States of America is 36.8 per 100,000 populations (46.2 for men and 31.1 for women) ([www.stopfalls.org](http://www.stopfalls.org)).

Based on Centers for Disease and Prevention (2008) data, each year one in three older Americans (65 and older) falls and about 30% of those falls require medical treatment. Falls are not only the leading cause of fatal and nonfatal injuries but also the most common cause of hospital admission for trauma.

More than \$19 billion annually is spent on treating the elderly for the adverse effects of falls: \$12 billion for hospitalization, \$4 billion for emergency department visits, and \$3 billion for outpatient care. Most of these expenses are paid for by the Center for Medicare and Medicaid Services through Medicare. It is projected that direct treatment costs from elder falls will escalate to \$43.8 billion annually by 2020. ([www.cdc.gov](http://www.cdc.gov) ).

Up to 30% of these who fall suffer injuries as hip fractures, or head traumas. In 2000, the medical costs for fatal fall injuries summed to \$179 million versus \$19 billion for nonfatal falls; these costs and incidence have been higher for women (54%) than for men (46%), (Stevens et al., 2006, pp. 291 – 292, Table 1, Table 2). One of the reasons medical expenditures for women were higher than for men is because of osteoporosis disease which affects older women. Another reason is that according with “The World Factbook” (Central Intelligence Agency, March 2008) the data for 65 years and over population (USA) there are more women (22 million, 2007 estimation) than men (16 million, 2007 estimation) and also women live longer than men (80.97 years/75.15 years ) ([www.cia.gov](http://www.cia.gov) ).

Although there are a lot of studies regarding patient falls and prevention many of them have focused the attention on patient falls in community based facilities than in hospital facilities. Most of the hospital facilities have their own approach regarding the definition of fall, the risk assessment tool they will use to screen patients and what prevention program will be adopted to reduce the incidence of falls.

### **Fall Definition**

Until now there is no universal definition of fall, thereby falls are defined and reported in different ways. In the study *Preventive falls in acute care* (McCarter-Bayer et al., 2005) the fall prevention team developed their own fall definition as being: “An unintentional descent that may or may not be assisted, that may or may not result in an injury, and in which any motion of descent may not necessarily result in a landing” (McCarter-Bayer et al., 2005, p. 28). This definition placed emphasis on a fall being more than an “accident” and resulted in under-reporting the falls. As a result the term

“prodromal” (McCarter-Bayer et al., 2005, p. 28) was introduced in relation to patient falls. Furthermore, the nursing staff was educated about a fall which potentially could be a signal of a new acute illness.

### **Fall Measurements and Fall Rates**

The rate of hospital admission due to falls for people at age of 60 and older in Australia, Canada and the United Kingdom range from 1.6 to 3.0 per 10000 populations. Fall injury rates resulting in emergency department visits of the same age group in Western Australia and in the United Kingdom are higher: 5.5-8.9 per 10000 population total ([www.stopfalls.com](http://www.stopfalls.com)). In the hospitals (USA) up to 20% or 1 in 5 elders fall during recovery from illness, and many patients are considered at risk of falling because of untoward medication effects or rehabilitation (Oliver et al., 2000, p. 1679).

Comparing fall rates among different health care facilities is difficult because of varying fall definitions, methods to report data and differences in settings and populations. The most commonly used statistic to measure and track falls in the fall rate is calculated as it follows: “Number of patient falls x 1000/Number of patient days” (Morse, 1997, p. 31). According to the unit manager of the cardio-thoracic service at Cedars-Sinai Hospital, one year since implementation of the program, the number of falls has decreased. Even so the hospital declines to cite the number of falls before and after the policy change because they are protected under California law covering peer review (Moore & Duncan, 1999).

Sullivan & Badros (1999) used the same formula to calculate the fall rate; the only difference is that the fall rate was calculated per unit (four medical/surgical units) not for entire hospital. The fall prevention team reviewed 137 charts for three-four

months periods. The mean age of those who fell was 70.8 years. The four medical surgical units' combined mean fall rates (for the three time periods) decreased from 9.3 to 7.3 per 1000 days (1999. p. 38).

Alcee & Mather (2000) conducted a study in a 248 bed community hospital. They reported the fall rate as a proportion between the numbers of patient falls per 1000 patient days. The average monthly fall rate was 4.43 falls during an eight- month period (Alcee & Mather, 2000, p. 48). In McCarter-Bayer et al.'s (2005) study, falls were reported as a fall rate: Number of patient falls per 1000 patient days. Most falls (80%) occurred in the patient's room and 37% of all falls were bathroom related. During a three year period the average rate was below 4 falls per 1000 patient days, with normal variation from month to month (2005, p. 32).

Sherrod and Good (2006) conducted their study in a medical-surgical unit of a large hospital; they analyzed the patient falls for a one year period. The unit's average rate over the period was 5.75 falls per 1000 patient days (the researchers met the initial goal of 3.82 falls/1000 patient days only twice). When the fall program remained without a permanent manager 13 falls were encountered in one month. Most falls in this unit (26%) occurred in those between 50 and 59 years of age; 70% of patients fell unattended in their rooms and 33% of the falls were toileting related. (Sherrod & Good, 2006, p. 28).

In their study, Sulla & McMyler (2006) do not define the formula upon the fall rate was calculated. After the implementation of the new fall prevention program fall rates have not decreased, as expected. Krauss et al. (2007) have used in their study, *Circumstances of Patient Falls and injuries in 9 Hospitals in a Midwestern Healthcare*

*system*, a less common formula (number of falls/number of 100 beds) to measure fall rates because patient-days were not available for all hospitals (which participated in the study) in order to use the widely accepted metric for calculating fall rates. The number of falls increased from 31.3% (first year of study) to 35.7% (third year of study) for all nine hospitals which participated in the study. In his review, Tingle (2007) outlined that in an average 800- bed hospital; there will be 24 falls every week, and over 1260 falls every year.

### **Types and Causes of Falls**

Many fall risk factors identified in the literature derived from fall classification, as a way to better understand the causes. One approach, developed by researcher Morse (1997, pp. 5-8), suggests that falls could be classified as accidental, unanticipated physiological or anticipated physiological falls. Anticipated physiological falls (78% of falls) occur in patients who score a high risk of falling on the Morse Fall Scale.

Accidental falls (14% of falls) are caused by environmental factors such as water or urine on the floor or because of a failure of equipment. Unanticipated physiological falls (8% of falls) occur when the physical cause is not reflected as a risk factor for falling. They cannot be predicted before the first fall occurrence. Anticipated physiological falls (78% of falls) occur in patients who score a high risk of falling on the Morse Fall Scale.

Another classification of falls is presented by Tideiksaar (2002, pp. 15-31) and is based on the assumption that they are an interaction of intrinsic and extrinsic risk factors. The intrinsic risk factors that he summarized are: previous falls, reduced vision, unsteady gait, mental status, acute illnesses, chronic illnesses. Extrinsic risk factors are related to the physical environment, for example: bathtubs and toilets, medications, design of

furnishing, condition of ground surfaces, poor illumination conditions, type and condition of footwear, improper use of devices. Sullivan & Badros (1999) established in their study five categories of fall causes: bathroom issues (41.9% of falls), incontinence, mobility, confusion, and “no information” (1999, p. 38). Oliver et al., (2000) identified that 80% (Oliver et al., 2000, p. 1680) of elders with falls in hospitals have one or more of these factors: altered mental status, a history of recent falls, medications, impaired mobility and toileting needs. And these conditions are associated with higher risk of falling.

Alcee & Mather (2000) quantified the falls in correlation with the bathroom use (30% of falls) and the consequences certain medications (26 % of falls) have on patient’s stability. Although the authors of the study did not find a correlation between sedatives, hypnotics, pain medications and falls the Quality Committee sent a memo to all physicians for a judicious use of these medications. The researchers have monitored patients with fall history because those were at a higher risk for repeat falls (10 % of falls). Oliver et al., (2004) described as emerging a small number of factors prevalent in fallers: gait instability; lower limb weakness; urinary incontinence/ frequency or need for assisted toileting; previous fall history; agitation/confusion; prescription of centrally acting sedative hypnotics.

McCarter-Bayer et al. (2005) outlined how important is to understand the risk factors and how they are the root of one patient risk of falling. Researchers identified in their study extrinsic factors as being related with use of restrains which have been misused; instead to reduce the fall risk actually increased one’s risk of fall. Other environmental factors are: “high gloss floors, fluorescent lighting, unfamiliar setting and inadequate footwear” (McCarter-Bayer et al., 2005, p. 27). The intrinsic factors are

related to patient's mobility and balance, advanced age, changes in gait, acute and chronic disease, and other.

In her review *Inpatient falls: Lessons from the field*, Hendrich (2006) stated that hospital falls are related to intrinsic causes. According to the researcher "less than 10-15% of adult hospital falls are caused by environment alone" (Hendrich, 2006, p. 130). Well-known environmental safety measures for all types of patients include lighting, assistive devices, furniture, clinical alarm systems, housekeeping, properly fitted shoes and clothing, personal assistance when needed to enable safe transfers and patient movement, keeping patient rooms and hallways free of clutter, and keeping objects within reach of the patient. The researcher has noticed that specialty procedures tend to migrate from acute care to the outpatient setting. As a result fall prevention has become a challenging process and more patients are in fact at risk for falling. A very high number of hospital admissions, "30-50% of all admissions" (Hendrich, 2006, p. 133) come from emergency department, consequently the number of emergency department falls is increasing in many hospitals. These are the same patients who will be assessed at high risk for falling once they go to their hospital beds. In Hendrich's opinion more than half of all falls occur while patients are trying to get to the toilet and while trying to exit the bed toward the toilet. Although this is a well known fact it is the one most often overlooked. Regular scheduled toileting of patients with high-risk fall due to impaired mobility or drug side effects will reduce falls in most acute care hospitals, yet this intervention is inconsistently applied. In order to reduce the fall risk associated with toileting some hospitals have utilized paper clocks (with moveable hands) that can be placed on doors to signal the next toileting time.

According to Sherrod and Good (2006) in their study *Crack the Code of Patient Falls*, most falls in the medical-surgical unit (26%) occurred in those between 50 and 59 years of age-contrary to the general assumption that falls occur in those 65 years and older; 79% of patients fell unattended in their rooms and 10% of them fell on the bathroom. The authors identified as among common activities associated with falls were toileting (33%), altered mental status (28%), and ambulating (25%) (Sherrod & Good, 2006, p. 28).

Krauss et al., (2007) conducted a study of falls in 9 hospitals in a Midwestern healthcare system for a three year period. The researchers studied the fall variations and risk factors among different types of hospitals. According with the researchers 82% of hospital falls occur in the patient's room, 85% are unassisted, and 47% are associated with toileting-related activities. For the purpose of the study hospitals have been divided on: academic, nonacademic, small, large, rural and urban or suburban. The falls data included the patient's birth date, sex, and mental status of the patient before the fall, the date, and the location of the fall. They gathered and analyzed toileting related falls, assisted or unassisted.

### **Patient Risk Assessment Tools**

The risk assessment tools are methods for identifying patients who are at risk for falling, so that fall prevention resources can be directed where they are most needed. The literature provides a variety of risk assessment tools that guide the development of a fall prevention program. The assessment for risk factors, performed by nursing staff, utilizes a form that assigns points to very specific factors. The degree of risk and fall prevention measures are then instituted based on patient's scores. Usually in acute care setting

patient risk assessments are completed: on admission, when changes intervene in patient's status, whenever a fall occurs, when transported or transferred to another patient care unit. The most researched instrument in the literature is the Morse Fall Scale (Morse et al., 1989); its development and level of validity and reliability have been tested across a variety of hospital settings. The scale consists of six items: history of falling, secondary diagnosis, ambulatory aids, intravenous therapy, gait and mental status (Morse, 1997, pp. 40-42). The scale produces two outcomes: low and high risk. The medium risk is left to the nursing staff latitude. The decision is influenced by the nature of nursing care staff and also by the availability of resources to support high risk patient population.

Oliver et al. (2004) reviewed 47 studies purporting to identify fall risk assessment tools. However, only two risk assessment tools fulfilled the validation criteria, and those were: Morse Fall Scale (Morse, 1989) and STRATIFY (Oliver, 1997). Also they concluded that effective falls interventions may require the use of validated risk assessment tools, or attention to reversible fall risk factors in all patients.

McCarter-Bayer et al. (2005) used in their study a universal fall prevention strategy throughout the Tucson Medical Center, Arizona. The fall prevention team selected Morse Fall Risk Scale to assess their patients, which was chosen as a result of its adaptability to specific population needs (p. 28). In this study researchers focused on the risk assessment utilization, which according with them it should be used on patient admission with reassessment at every shift (12 hours).

In *The experience of a community hospital in quantifying and reducing patient falls*, Alcee & Mather (2000) were concerned whether the Fall Risk Assessment utilized was current and consistent with other existing tools or if it needed modifications. The

nursing staff has adapted its Fall Risk Assessment to respond the needs of elderly population. In addition the Fall Investigative Report (postfall form) included: patient's age and if the patient was expected to be discharged within 24 hours.

Sulla & McMyler (2006) focused their research on fall prevention as patient falls can influence the outcome of care. The Mayo Clinic, Rochester prevention team replaced the screening questions, which identified patients at risk with an evidence-based tool. But the definitions of the risk factors in the assessment tool were recognized as a barrier and a source of confusion. The nurse specialists conducted an audit and they found between "91% and 100%" accuracy (Sulla & McMyler, 2006, p. 142) with the policy and procedure. The advantages of Hendrich II Fall Risk Model (see Appendix E) included: evaluation on medication, fall risk and an educational module. The nursing staff introduced data electronically, documenting the patient's risk. Also in the documentation was created a row called "unable to assess" (Sulla & McMyler, 2006, p.142) – used for sedated and on ventilator patients. Nurses were sending comments about the process to the programmers of the electronic record and based on this feedback new interventions were set up.

According with Perell's (2002, p. 67) article *Assessing the risk of falls: Guidelines for selecting appropriate measures for clinical practice settings*, very often hospital facilities will develop their own fall risk assessment scale, based on fall risk factors from literature or chart reviews of their own patients. Therefore those tools are limited because individually developed instruments lack psychometric standardization and as a result they may not be reliable or valid. The author also stresses on the selection criteria for a specific instrument which might vary depending on the health care facility and types of

professionals responsible for completing the assessments. The patients are screened using the following instruments: the Morse Fall Scale (Morse & Tylko, 1989), STRATIFY (Oliver et al., 1997), the Hendrich Fall Risk Model (Hendrich et al., 1995). Perell concludes that if an assessment tool is chosen and used correctly it can be the first step in fall prevention (Perell, 2002, p. 68).

The fall prevention teams from two Maryland hospitals selected an assessment tool developed by Spellbring (1992). Some of the risk factors included in this tool are: previous falls, mental status changes, mobility deficit, communication deficit, sensory deficit, medications, auditory deficit, and improper footwear. The risk assessment tool was utilized in a rate of 75.5%, which did not meet The Joint Commission's requirements of 90% (Sullivan & Badras, 1999, p. 38).

**Communication of fall risk to patient, family, staff – interventions to make the environment safe**

A randomized study was conducted to determine the effectiveness of the identification bracelets in preventing falls among high-risk patients. The study found that in the intervention group 41% of persons fell at least once, whereas in the control group 30% fell at least once. The results suggested that the identification system was of no benefit in preventing falls among high-risk persons (Mayo et al., 1994).

Oliver et al., (2000) stated that individual interventions showed no benefit or reduction in fall rates. The combined results from several studies showed a 25% reduction in fall rate. According to Jackson & Gleason (2004) a successful fall program must begin with staff and management commitment. The staff members of the St Clare Hospital, Washington implemented a bed-monitoring system to help prevent patient falls.

Also the emphasis of the study was on training, education and communication to increase staff and patient awareness and staff competence and compliance. The patients at risk were identified through the use of wristbands, color-coded cards placed on the room doors and in the patient charts. As the results with the bed-monitoring system improved the nursing staff requested the use of this technology for chairs and wheelchairs.

The nursing administrators from Tucson Medical Center, Arizona communicated a patient's fall risk to staff and visitors by developing visual safety signs that were displayed in patients' rooms. Also they developed a bright orange armband for patients who were at high risk of falls. Besides these signs the fall prevention team developed a hallway door sign, a reminder sign for any visitors and staff and they chose color yellow as recognition of fall risk; patients wore yellow wristbands when they left their room or nursing unit. Incident Report was replaced by Fall Investigative Report (after fall assessment) that included information on contributing factors to fall and potentially actions that could have avoided the fall. By reporting this data staff planned to establish benchmarking data to compare their fall prevention to other similar settings. Furthermore, they aimed at patient's contact with patient care staff to offer toileting assistance and water, non-skid footwear, and limited use of restraints and side rails (McCarter-Bayer et al., 2005, p. 27). Communication confusion may arise in the case of nurses and physicians working at different hospitals in the same area; in a hospital yellow color wristband could signal patient at high risk of fall and in other the same color wrist band might mean DNR (do not resuscitate) or allergy (Landro, 2007, p. D5).

## **Fall Prevention Program**

According to the Centers for Disease Control and Prevention “In 2004, 14,900 people 65 and older died from injuries related to unintentional falls; about 1.8 million people 65 and older were treated in emergency departments from nonfatal injuries from falls, and more than 433,000 of these patients were hospitalized” ([www.cdc.gov](http://www.cdc.gov)). There is no simple fall prevention strategy to fit for all patient populations, residents or all kind of healthcare facilities. Falls appear to happen as a complex interaction of extrinsic and intrinsic risk factors, and interventions to address them require a multi disciplinary approach. Morse (1997, p. 48) states that: “Because patients fall in infinite variety of circumstances, the interventions developed to prevent a fall cannot be standardized. Fall prevention strategies must be identified for each patient individually”.

For the purpose of the study McCarter-Bayer et al., (2005) chose an interdisciplinary team to address the fall prevention program. The team used Lewin’s (1951) theory, Force Field Analysis, which viewed “The change process as a system of restraining forces and driving forces” (McCarter-Bayer et al., 2005, p. 28). As restraining forces team outlined: fall data were not presented in a comprehensive way, staff turnover, knowledge deficits among patient care staff. On the other hand driving forces facilitated the introduction of the fall program. After addressing these restraining and driving forces resulted a “feed-back loop” (McCarter-Bayer et al., 2005, p. 28) and falls data were provided by every unit. Moreover the management and staff have responded to individual needs of their population. Hendrich (2006) stated that,

Successful fall prevention programs have measurable attributes, which include:

- Research-based risk factors that are applied at unit of care.
- Consistent attention to environmental hazards for all patients,

- Nursing and medical interventions aligned with reduction of fall risk factors for individual patients,
- Continuous learning about unit-specific fall occurrences derived from good fall data, and
- Effective communication of patient risk and teamwork among caregivers and across units-no matter where the patient is in the hospital. (Hendrich, 2006, p.132)

Alcee & Mather (2000) monitored the compliance of the fall prevention program in an acute care setting. The existing program was not used accordingly with the nursing policy and procedure. Thereby the fall prevention program was revised regarding its execution. Furthermore, the nursing staff was made responsible that each fall report specified whether the patient was on the fall prevention program (Staff Against Fall Everywhere) and if so what measures were taken to prevent falls from happening. Nursing staff's lunches and dinners were rescheduled, hourly rounds have been reinforced and the staff was to be held accountable to assure the rounds occurrence.

Sullivan & Badros (1999) described the implementation and evaluation of a successful fall precaution program in a health care system. The program has been developed to prevent the increasing in fall rate noticed in the medical surgical units and to address standards of The Joint Commission. The program effectiveness has been evaluated by reviewing patients' charts from three periods (four month length): before development of the program, immediately after implementation, and one year after implementation. The prevention team examined the nurses actions regarding the plan of care instituted for a patient at risk of falling. The nurses measures were monitored whether they initiated the correct plan of care; initiated a plan without an associated risk factor; or failed to initiate the appropriate plan when a risk factor was present (55.1% of cases they failed to initiate a plan of care).

According to Sherrod & Good (2007), when implementing fall prevention program the applied data has to be unit-specific. First of all, the data has to be categorized by age, location, day of the week, time of day, fall risk status, and common themes such as toileting, ambulation, or previous falls. These indicators have to be reviewed monthly. Secondly, the data have to be analyzed and compared to the facility's rate in order to observe improvements or to make corrections. The authors cited that other studies found a relation between adequate staffing and a low fall rate. Therefore a manager should observe and report to administration if staffing is a factor to a high fall rate.

Next step on the execution of the fall prevention plan is to assess staff knowledge of facility policies regarding falls and risk assessment tools that determine patient risk. Workshops related to fall prevention should be offered to those who need improvement. Then nursing staff will be held accountable to act according on the information they have received. Also a positive behavior (games, prizes, and incentives) should encourage the staff keeping up the good work. Sherrod and Good emphasized on compiling the data on each fall and evaluating it on a "case-by-case basis" (Sherrod & Good, 2006, p. 28). Posters and bulletin boards will be used to increase the staff awareness. Also is recommended to review data quarterly to observe if the increase is a trend or only a temporary spike.

Nurses, patient, and family assisted in preventions efforts; they focused on patient's risks and developed individual fall prevention plans. In the third month since implementation the fall prevention program remained without a permanent manager. Without a supervisor for two months the program floundered with 27 falls. Then a new

manager was hired and the program was reinstated registering only one fall for the month.

### **Interdisciplinary Approach to Fall Prevention**

In Hendrich's (2006) opinion "an effective fall prevention program requires that clinical practice groups, shared governance councils, interdisciplinary teams, and leadership work together to develop best-practice guidelines and adult-learning techniques and program components" (Hendrich, 2005, p. 134). Among interdisciplinary team duties should be to review and screen medications, dosages and interaction during hospitalization and related to patient's discharge.

Sulla & McMyler (2006) chose an interdisciplinary team to address the gaps in the fall screening process. The team was comprised from physicians, pharmacist, nursing, research analyst, system analyst. One of the team's tasks was to educate staff and patients about fall risk factors. Other initiatives included: updating the initial assessment to include data about history of falls, standardized patient education, developing a web site with new information and resources.

Other researchers as McCarter-Bayer et al. (2005), preferred to use the same approach regarding fall prevention programs. Their decision was based on the literature review, which suggested that strategies have been successful when multiple viewpoints and knowledge bases were used. In the fall prevention protocol the team has outlined the following components: fall definition, an assessment tool, communicating the fall risk, instituting a "universal fall prevention intervention" (McCarter-Bayer et al., 2005, p. 28), and educating staff.

## **Staff Education**

Sullivan & Badros (1999) described in their article the educational plan for all registered nurses. The plan included a fall practice guideline, an early assessment tool for patients or residents at risk for falls. Alcee & Mather (2000) measured the influence of a fall prevention program on falls occurring in the Memorial Hospital, Port Jefferson, NY. As the researchers identified gaps in the completion of the fall risk assessment regarding consistency and accuracy, the nurse managers were made responsible for increasing awareness through mandatory unit- based education. All nursing staff was re-educated on the use of the fall risk assessment upon patient admission and every shift, and about the new change in standards to reflect a patient status (if he/she was considered a patient at high risk for falling will remain so until discharged). Jackson and Gleason (2004) underlined the importance of the staff education. The researchers stressed this through one-on-one training, meetings, videos, and the hospital personnel launched an effective poster campaign based on the falls theme.

McCarter–Bayer’s et al. (2005) emphasized on staff education and moreover information related to falls should be included into the hospital’s new employee curriculum in order to maintain staff’s knowledge. The interdisciplinary team organized an annual “Clinical Education Fair” (McCarter-Bayer, 2005, p. 30) to educate staff in fall prevention. The staff has been educated in three phases with tests on knowledge about regulatory purposes such as Joint Commission accreditation. The second phase outlined on differences between preventable and non-preventable falls.

In other words, falls in older adults might be a symptom requiring further investigation to determine the root of the fall. This helped staff to understand that falls



The Joint Commission requirement regarding patient falls is to implement a fall reduction program and evaluate the effectiveness of the program (these data report the percentage of hospitals complying with the requirement). In 2006, “The Joint Commission accredited hospitals that achieved a national average performance of 93.5 percent of assessing and periodically reassessing each patient’s risk for falling” ([www.jointcommissionreport.org](http://www.jointcommissionreport.org)).

The emphasis on the Moore & Duncan (1999) study was on The Joint Commission’s involvement as a regulatory agency. Since 1997, The Joint Commission has required hospitals to perform a” root-cause analysis” (Moore & Duncan, 1999, p. 2) to track fall related injuries (called sentinel events) and to detect the systems failures. The hospital does not submit its findings to The Joint Commission because the state’s health association fears that the information might be discovered by plaintiffs’ attorneys.

Although The Joint Commission has asked hospitals to forward their findings to compile a database of accidents and uncover patterns behind the events, hospitals rarely comply with this requirement. The Joint Commission is working to remove this impediment. “One of the patient protection bills now before Congress includes provisions to compel mandatory reporting of errors and near misses”(Moore & Duncan, 1999, p. 3).

Since January 2006, all accredited healthcare facilities were surveyed for implementation of applicable goals (patient safety) and requirements. One of the patient safety goals is related to patient falls, which states that facilities must implement a fall reduction program and evaluate its effectiveness. The Joint Commission categorized as acceptable interventions for National Patient Safety Goals into five areas: physical

measures, psychological measures, environmental measures, staff education, and patient and family education (Sherrod & Good, 2006, p. 1).

Sulla & McMyler (2007) divided the fall prevention program into five components: risk assessment and screening, communications, culture and delegation, education and facilities and environment. The fall prevention team was prepared to address the 2005 National Patient Safety Goal, “Reduce the risk of patient harm resulting from falls”(Sulla & McMyler, 2006, p. 140), sponsored by The Joint Commission. The fall prevention team developed the following aims: effective strategies for fall prevention, if effective they will be replicated throughout the hospital, reduce the fall rate “by 50%” (Sulla & McMyler, 2006, p. 140), reduce the fall related injuries and, introduce environmental changes to maximize fall prevention. As stated by The Joint Commission the goals for daily frequency of the risk assessment tool and the plan of care for the specialty areas are 90% (Sulla & McMyler, 2006, p. 142). If this requirement is not met the information about fall prevention is reinforced.

### **Cost Implications in Patient Falls**

In order to reduce patient falls and the costs related to them there is an option to use a “Medical Vigilance System” (Spetz et al., 2007, p. 334). The cost effectiveness of this system is analyzed by Spetz et al. in a study at St. Joseph’s Hospital and Medical Center in Phoenix, Arizona. The medical vigilance system (LG1) was supplied by Hoana Medical, Inc. which provided financial support to conduct the study. The LG1 system comprises two components: a) a passive sensor array placed under patient’s bed, and b) a bedside unit that connects to the nurse call system already in place at the hospital. The LG1 systems were installed in the post-neurosurgery unit of the hospital. This unit has

used patient sitters to prevent patient falls, and the fall rates associated with patient sitters were compared with those from LG1 trial.

Costs of each fall prevention approach were compared, and decision-analysis software was used to conduct a cost effectiveness analysis. The cost of using LG1 system was about \$76 per patient (Spetz, 2007, p. 337). Estimated incremental cost per avoided fall through use of the LG1 was between \$5959 and \$6301 (Spetz, 2007, p.337). If hospitals experience other costs from patient falls of more than this amount (due to lawsuits or lost revenues because patients prefer safer hospitals) the use of LG1 system is cost savings. The trial demonstrated the effectiveness of the LG1 system in reducing the rate of patient falls. The cost-effectiveness analysis found that use of this system was associated with somewhat higher measured costs. Therefore further investigations of this type of LG1 system and other fall prevention strategies should be conducted to improve nursing leaders' ability to reduce patient fall rate and reduce health care costs.

### **New Medicare Regulations**

According to Spath P. (2007) beginning with October 1, 2008 hospitals will not receive payments to cover for certain secondary diagnoses that have been acquired during hospitalization, unless these conditions were present on patient's admission. Under the new Medicare policy health care managers will have to pay attention to the ways they deliver services and to overall hospital safety. Falls are one of the hospital incidents for which Medicare will no longer pay the extra costs. Spath outlined that "recent studies of fall incidence during hospitalization report an average fall rate of up to 3.6 per 1000 days" (Spath P., 2006, p. 1).

## **Findings and Conclusions**

The fall precaution program described in Sullivan & Badros (1999) study was a successful one: the fall rate registered a reduction, and it increased nurses' risk assessment practice. Nevertheless, nurses used the fall risk assessment tool frequently (75.5%) they did not meet The Joint Commission's standard of 90%, which indicates the necessity for further staff education (Sullivan & Badros, 1999, p. 40).

Although the *Cedar-Sinai hospital reduces falls* (Moore & Duncan, 1999) does not share information about the number of falls or findings about the root-cause analysis. Also it does not contribute to the national knowledge base on medical errors. Romanoff the vice president of medical affairs, states: "We learn a lot. We improve. But that data is not being used outside the institution" (1999, p. 3).

Alcee & Mather (2000) researched the impact of a fall prevention program on falls for an eight-month period in an acute care facility. A focus of the study has been on educating staff for a consistent and accurate completion of the risk assessment tool. Another emphasis was on the enforcement of the plan of care which should include hourly patient checks, toileting assistance and repositioning as needed. The study strength was on identifying as a major fall cause patient's attempt to get out of bed and use of the bathroom. The researchers found that toileting a patient may prevent only 30% of falls (related with elimination) from occurring (Alcee & Mather, 2000, p. 47). We do not have information about the previous fall rate and therefore we cannot conclude and analyze the fall prevention program efficiency. The average fall rate has been 4.43 falls per 1000 patient care days during the eight-month period. The study stresses on encouraging the hospitals to measure their fall rates and to share the information to create benchmarks

which may be used as a goal in reducing patient falls. Jackson & Gleason (2004) analyzed in their study the use of electronic devices on beds that measure the patient's shifts and signal when a patient is in the process of exiting a bed. The study used this technology to decrease the use of restraints (they decreased 99%) and companions.

McCarter-Bayer et al. (2005) have emphasized in their study on defining the term fall and using an interdisciplinary approach to prevent falls among patients. As a method of training they used focus groups from all levels of patient care. The questions were related to falls, fall prevention, and proposed changes in the process. In the researchers opinion "fall" (McCarter-Bayer et al., 2005, p. 32) is more than an accident. This approach allowed for a cross-study comparing data through entire hospital.

The strength of McCarter-Bayer's (2005) study is that using the hospital's intranet, data was always available to all staff: by month, year or unit. Control charts allowed the staff to understand the monthly variation in the process. The fall prevention team introduced visuals signs—cartoon characters, color and creativity to increase staff participation in the fall reduction. As a consequence patient care interventions were carried out to specific patient populations and moreover the outcomes were individualizes. The education had a positive impact on bedside staff and managers who have been empowered to implement and maintain a fall prevention program that consisted on high level of safety. The study (three years period) recorded no changes in the number of falls—"an average of 4 falls per 1000 patient days" (McCarter-Bayer et al., 2005, p. 32).

Hendrich (2006) outlined in her overview that hospitals use "home grown" (2006, p. 134) lists of factors with little scientific basis. Her opinion is that the list of hospital-based risk factors is often too long and based on personal observations. A list that is not

research-based may find that every patient is at risk for falling. Another factor specific to American healthcare is polypharmacy (more than six drugs). Therefore to predict fall risk is better to consider the presence of drug side effects rather than scoring the patient based on the drug alone.

Hendrich's affirmation was that fall programs fail to reduce falls because too often strategies are implemented after a fall occurrence, not before. The documentation time, fragmented communication between nursing staff and inefficient work processes may contribute to the inability of nurses to provide safe and effective care.

She emphasized that reliable fall data should include fall index and injury rates by unit and hospital in order to support a successful fall prevention program. Hendrich (2006) summarized that comprehensive fall prevention program may be possible when practical strategies and teamwork are used to provide a safe environment for delivery of care.

Sherrod & Good (2006) summarized that unit-specific data provide information regarding who is at great risk, when they are more likely to fall and for what reasons, and also how nursing staff can contribute to preventions strategies. Sulla & McMyler (2006) used in their study an interdisciplinary approach to focus on fall prevention. The fall prevention team achievement was the implementation of the risk assessment tool throughout the hospital setting. Although fall rates have not decreased since implementation of the program the number of fall related injuries and the time between them has decreased. The researchers' assumption is that the fall rates did not register a reduction because of the possibility that more falls are reported since the program's implementation. The interdisciplinary involvement improved the communication about

the fall prevention program. Consequently the organizational culture changed which in turn increased the program's chances of success.

Spetz et al. (2007) study was limited by its small size and data restrictions, but it provides directions for future research and demonstrate methods that might be useful in future studies of the cost effectiveness of fall prevention methods. Its weakness is provided by the financial support and supplied by the supplier of the devices (LG1). An independent study should result in more balanced conclusions. From a societal perspective "If the pain and suffering costs associated with falls are greater than about \$6000 per fall, then the use of the LG1 system is cost-savings" (Spetz et al., 2007, p. 338). Health care leaders should recognize that interventions that are beneficial to society as a whole might not provide "A positive return-on-investment to a hospital" (Spetz et al., 2007, p. 338). The trial demonstrated the effectiveness of the LG1 system in reducing the rate of patient falls.

Krauss et al. (2007) study, found that differences in the fall rates and types of fall among hospitals could be caused by differences in types of units (psychiatry or rehabilitation might affect the rate). Another correlation noticed by the researchers was between age and type of injury. According with them increased age was a risk factor for any type of fall-related injury in acute care facilities. The authors outlined that at the time of the study these hospitals were using different falls definitions and in their opinion to track and study falls among hospitals "the fall reporting should have standardized definitions" (Krauss, 2007, p. 550). They concluded that reporting practices should be consistent within and among hospitals, in such a way that fall and injury rates can be

calculated and rates compared to share successful methods of decreasing hospital falls and injuries (Krauss, 2007, p. 550).

In summary, the most common causes of falls that emerged from the literature review are: altered mental status, a history of falls, age (the significance as a risk factor remains unclear), medications, elimination needs, or mobility deficits. In essence, the circumstances when a patient is at high risk of falling are a combination of environmental and physiological factors. In more of the studies the fall prevention policies were limited to the interventions that nursing staff (Sullivan & Badros, 1999, Alcee & Mather, 2000, Jackson & Gleason, 2004, Sherrod & Good, 2006, Spetz et al., 2007) can carry out, rather than also involving doctors and other staff. To be effective the efforts to reduce falls and injury will need to involve a wide range of staff, in particular nursing, medical, pharmacy, management, and facilities services. (Moore & Duncan, 1999, McCarter-Bayer, 2005, Sulla & McMyler, 2006). Preventing falls however is a challenge for all healthcare professionals. Approaches to preventing falls must be individualized, as each patient is affected differently by a range of risks factors.

## **Chapter III**

### **Methodology**

The present study used data collected from the patients and nursing staff of the Mount Vernon Hospital. The study was conducted on a 196-bed acute care hospital in order to identify the patients at risk of falling, to evaluate the nursing staff's interventions and to analyze the compliance with the health policy. More specifically, the data was obtained from statistical records (patient charts) of medical-surgical unit, psychiatry unit, medical surgical unit, telemetry, and correctional services.

Although to evaluate the hospital's health policy was necessary to review the entire patient population the emphasis was on the patients at risk of falling. An important part of the data addressing patient falls, the factors that trigger falls and the interventions to prevent/reduce falls from occurring were gathered from the literature review. The analyzed data was used to determine the following:

#### **1. What are the factors that trigger falls?**

This data was collected from the Post Fall Report (see Appendix D) and Occurrence Report of The Mount Vernon Hospital regarding falls reported on March 2007 and April 2007 (the period of our research) and literature review of risk factors. Analyzing the data for patients who fell during this period and from case studies and reviews we gained a better knowledge of nature and prevalence of risk factors which is a preliminary step in the planning of future fall interventions.

## **2. What is the hospital's policy toward interventions to prevent falls from occurring?**

One of the methods of data collection used was from statistical records-patient charts, and Nursing Service Policy/Procedure of The Mount Vernon Hospital. For the purpose of this study was developed a Research/Observation instrument (see Appendix C) to evaluate how the nursing staff initiate the specific interventions and followed the policy. The research/observation instrument was developed and authorized by the vice president operations and quality to identify the patients at risk of falling and how the nursing staff initiates interventions in order to prevent falls from happening. The fall prevention policy is the standard of care upon every patient admitted in the hospital is assessed of risk for falling. The information was collected from the period of March 1, 2007 – April 30, 2007 from 239 patient charts. Another method used was to relate about other interventions from the literature review and compare to our research.

## **3. How well is the hospital staff complying with the health prevention policy on falls?**

As a method of collection data, the patient charts of Mount Vernon Hospital were used; Nursing Service Policy/Procedure (fall prevention policy, see Appendix A); data from the Fall Risk Assessment/Reassessment form (see Appendix B); and the research/observation instrument to evaluate the utilization, accuracy and consistency with the existing standard of care. The information was collected starting with March 1, 2007 through April 30, 2007. A number of 239 patients' charts were reviewed at a three period intervals as it follows: the first survey included 70 patients' charts, the second survey included 85 patients' charts, and the third survey included 84 patients' charts. The results

from research/observation instrument were aggregated to determine correlation among different variables.

The nursing staff interventions were evaluated whether they screened the patients or utilized correctly and consistently the risk assessment tool. Another method used here was obtained through a synthesis of the similar case studies from the literature review.

#### **4. How effective has health policy interventions been in reducing hospital falls?**

The effectiveness of the fall prevention policy was analyzed using the research/observation instrument and by reviewing data gathered from the Mount Vernon Hospital, Risk Management Department, and more specifically the number of patient falls/ month from October 2005 to April 2007 (retrospective). Data was collected from patients and nursing staff who participated on a three separate surveys from March 1, 2007 through April 30, 2007.

The patients at risk of falling were checked to assure that the nursing staff was knowledgeable about the hospital's fall prevention policy and The Joint Commissions standard regarding patient-safety goals, and also how those requirements were integrated in practice. Additionally, literature review was used to compare other hospitals' fall intervention programs and their approach to fall prevention was analyzed in order to determine what strategy could be more effective.

The quality of health data depends very often of the conditions under which it was collected and as a result there are problems with its reliability and validity. One of the limitations of the study is the use of a research-observation instrument. The data gathered through this method can be questionable since it depended of the data from written

reports (as risk assessment form). These reports could be a source of error and bias because they are completed by the human beings.

The reliability of the data could be influenced also by the patient's ability and cooperation, and moreover by the number of the patients seen at the hospital on the day data are recorded. In the present study along with those reliability and validity issues we have reactivity issues caused by the presence of an observer. Individuals tend to behave in a more desirable manner when they are being observed. However, the advantage of using the Research/Observation instrument for this study, beside to the low cost, is its accessibility of the questions and its applicability to all hospital's units.

Another limitation of the present paper is that relied on data from the risk assessment form (a screening form for all patients admitted on the hospital; which is the same as the Sound Shore Medical Center). This risk assessment form is developed by the Sound Shore Hospital. Such self developed tools may lack any psychometric standardization and therefore may not be reliable or valid.

Regarding the ethical aspects of the research, this study analyzed results in terms of population without identifying specific individuals (patients' participants in the survey). However, the nursing staff and patients were informed about the purpose of the study. One of the purposes of the study was the evaluation of an ongoing program – fall prevention, and therefore it was not necessary to obtain informed consent from the nursing staff. The nursing staff was informed about the participation in the surveys. Even so anonymity of the participants is maintained for the entire part of the study, because medical records numbers were used instead of names.

The most common method used by the researchers in their studies about patient falls, and fall prevention was a description of the study. As a caveat, the data collection methods and results were in many cases incomplete, which made it difficult to determine what kind of research methods were used or what the results were.

Furthermore, among the reviewed case studies, every hospital used a different approach to define fall, to screen patients at risk of falling, to identify risk factors for falls, or to implement/monitor fall prevention programs. Therefore, these studies were limited regarding their usefulness.

## **Chapter IV**

### **Findings**

The purpose of this study was to identify the patients at risk of falling, to evaluate the utilization of the risk assessment tool, and the compliance of the nursing staff with the existing health policy. Therefore, the research sought to examine the nurses' interventions on applying the plan of care to address the needs of those patients who were at a higher risk of falling. The study was conducted on a 196-bed community hospital and a number of 239 patient charts were reviewed during a two-month period (at a three period interval).

For every patient chart was filled out a research observation tool to evaluate the utilization of the fall risk assessment form and the compliance with the existing policy. After we aggregated the data from research observation tool we have focused on patients at risk for falling. The following documents were reviewed: fall prevention policy, Risk Assessment forms (screening tools to identify the patients at risk) for current admitted patients, Occurrence Report, Post Fall Report, and retrospective data on number of falls and fall rates. According with the hospital's policy (see Appendix A) every patient should be assessed for risk of falling within 12 hours of admission and at designated intervals throughout his/her stay.

The Fall Risk Assessment form (see Appendix B) includes patient age, a review of drugs that have been linked with increased falls, and interventions aimed to make the environment safer for those patients who are at risk of falling. This screening tool was developed on by The Sound Shore Medical Center. The fall prevention policy was implemented on July 2005. In 2006 the initial fall prevention policy was revised to

include new criteria for safety evaluation. The score registered by the patients is based on the nursing staff input; they evaluated the patient and summarized the points and function of their accuracy a patient will be included in the plan of care to address the fall risk or will not be included. From a total of 239 patient charts reviewed, 18 patients (8%) were not assessed for risk of falling. (see Figure 1).

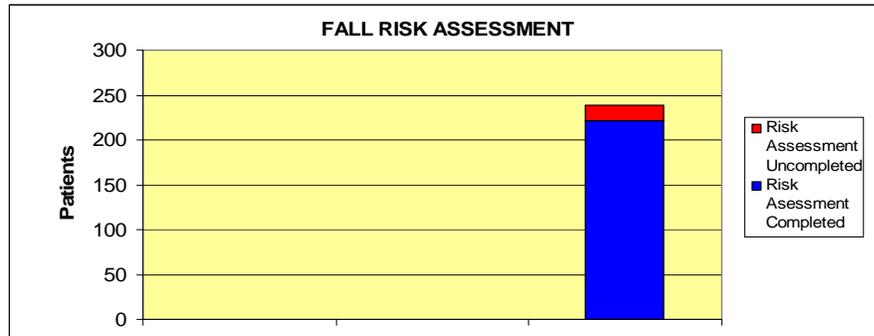


Figure 1. Fall Risk Assessment Completion

Among the 239 patient charts reviewed, 50 patients (21%) were at risk of falling and according with the health policy the nursing staff have to institute a plan of care. The instituted plan should address patient safety goals required by The Joint Commission, which overall should be oriented toward falls prevention (see Figure 2).

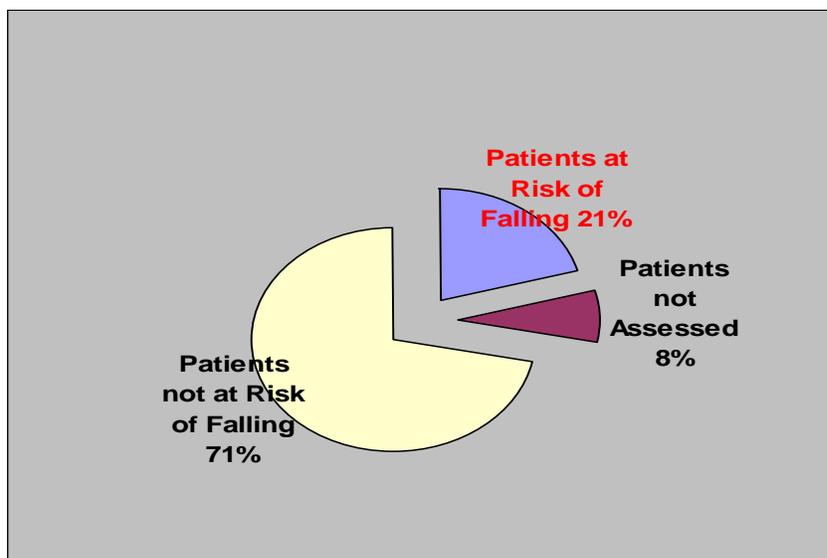


Figure 2. Patients assessed on admission

The patients who were determined to be at risk for falls and registered a total score of 8 points or more when screened (see Appendix B, Fall Risk Assessment/Reassessment) were the subject of the fall preventions interventions.

For those patients identified to be at risk of falling the hospital's policy requires the following visual signs: red ID wristband, helping hands magnet on the patient's door frame, and a helping hands sticker on the cover of the patient's chart. After we reviewed the patient's risk assessment form, every patient at risk of falling was verified to assure whether the nursing staff was following the hospital policy and initiated the appropriate plan of care to respond to patients' needs.

The findings are that from a total of 50 patients at risk of falling, 31 patients (62%) were not wearing a red ID wristband as a precaution sign for nursing staff and visitors about their condition (see Figure 3).

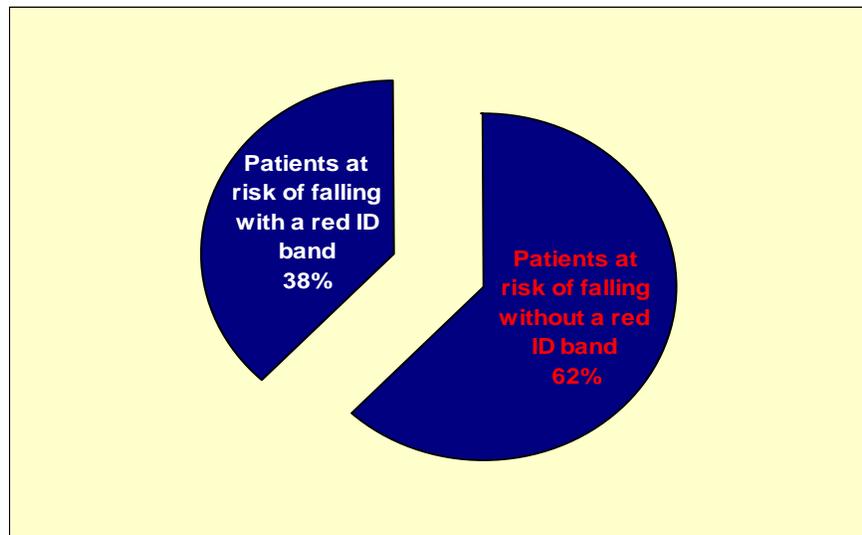


Figure 3. Compliance with the fall prevention policy - red ID wristband use

Also as we aggregating the data we have found that a number of 19 patients were not having on their door frame the helping hands magnet and the helping hands sticker on the cover of the chart (see Figure 4).

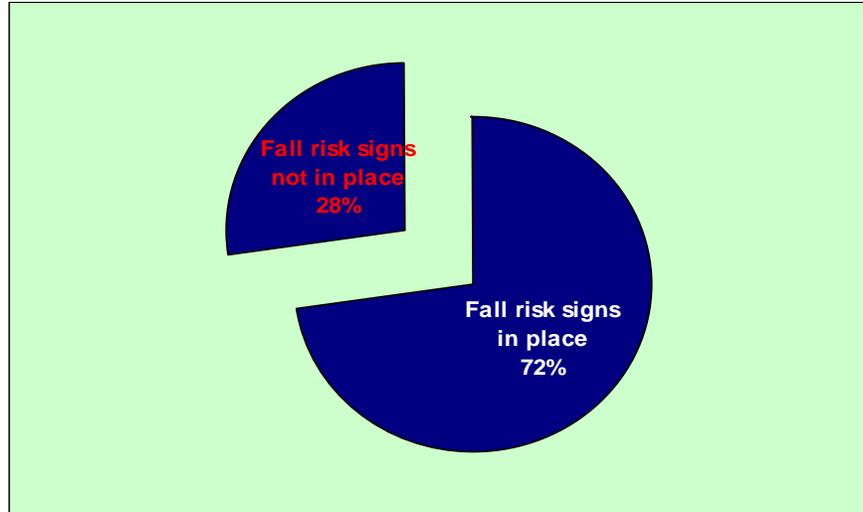


Figure 4. Compliance with the policy –signs on the cover chart and door

Other interventions that nurses are required to take to protect the patients are: to move patient closer to the nurses’ station, to check hourly the patient; to make sure that the bed alarm and chair alarm are in place or family companion is present in the patient ‘s room. A number of 26 patients were not moved closer to the nurses’ station (see Figure 5).

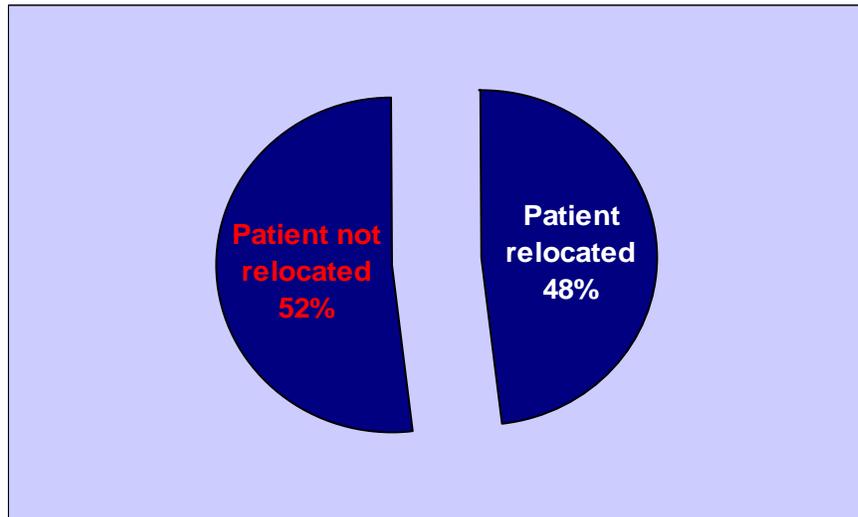


Figure 5. Interventions aimed to prevent falls – Patient relocation

Of those 50 patients at risk which have been found as being at risk, 23 patients (46% of patients) were not monitored hourly according with the standard of care.

Also the nurses were not using the bed alarms and chair alarms, from a total of 50 patients at risk, 3 bed alarms were in place (see Figure 6), 1 chair alarm, and 4 family/companions were with the patients. While reviewing the risk assessment forms we found that 8 patients had additions of new medications in the categories listed on the risk assessment tool (see Appendix B, Fall Risk Assessment/Reassessment, The Mount Vernon Hospital). According with the policy, these patients should be reassessed and the nursing staff should implement additional protections to prevent falls from happening. The nursing staff reassessed 3 patients, and 5 patients (62%) were not reassessed.

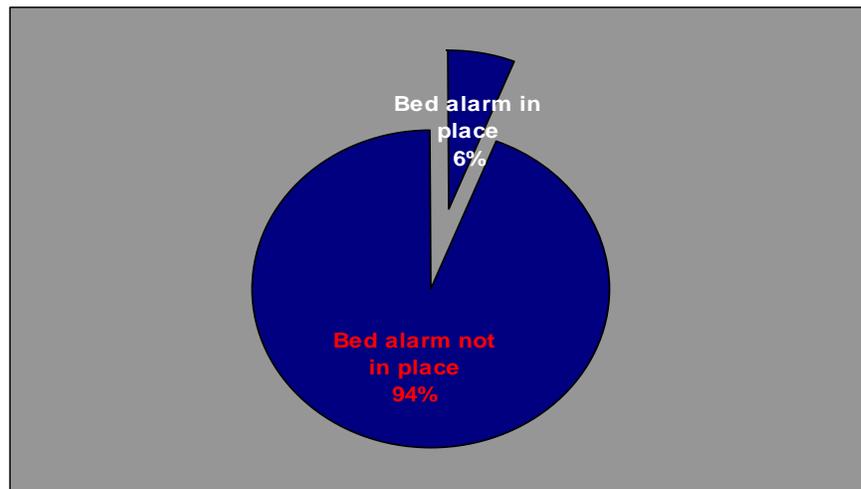


Figure 6 Interventions aimed to prevent falls - Use of bed alarms

As Figure 7 reflects, the greatest percentage of patients at risk for falls (32%, 25%) occurred on the medical surgical units. These results could be intuitive because the medical/surgical patients were under the effects of anesthesia and medication, and therefore they have a greater risk of falling. Also these units exceed at patients without a fall risk assessment if we take in consideration the total number of patients per unit – 10% and respectively 9% of the patients were not evaluated for falls.

The outcomes from the research observation instrument, which was used to evaluate the utilization, the accuracy of the fall risk assessment, and the compliance with

the policy, were discussed with the nursing staff. Although, the results from this study that relates to fall risk assessment completion have a great significance in evaluating the hospital's policy they cannot be compared to the Sound Shore Medical Center policy. These hospitals have different policies and data could not be compared. Almost every hospital used another screening tool in assessing the patients and they included their own risk factors to determine whether a patient is at risk of falls or not. From the literature review we observed that every hospital is in a way unique in terms of fall risk assessment tools, calculation of the fall rate, and fall prevention programs.

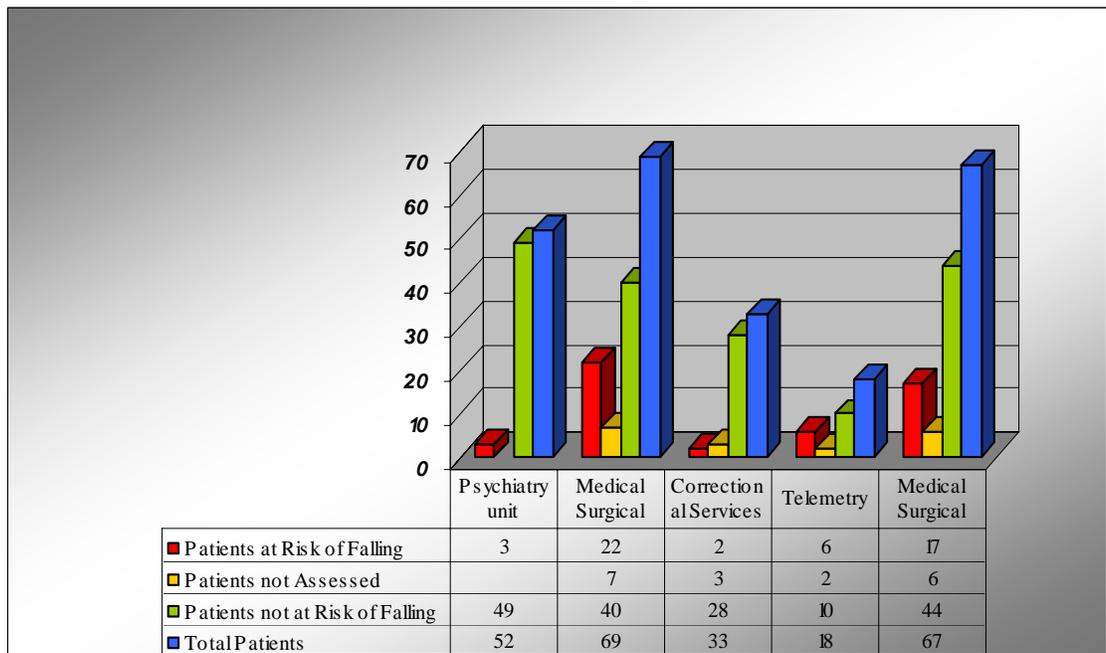


Figure 7. Patients fall risk assessment per unit

The research was successful as it improved the rate of the utilization of the risk assessment tool (from 88.6% to 95.3%). Consequently, we can affirm that more patients were assessed for risk of falls when the nursing staff was closely monitored. At the first survey after we computed the data 11.4 % of the patients were not assessed; the second survey - 7% of the patients, and the third survey – 4.7% of the patients (see Figure 8).

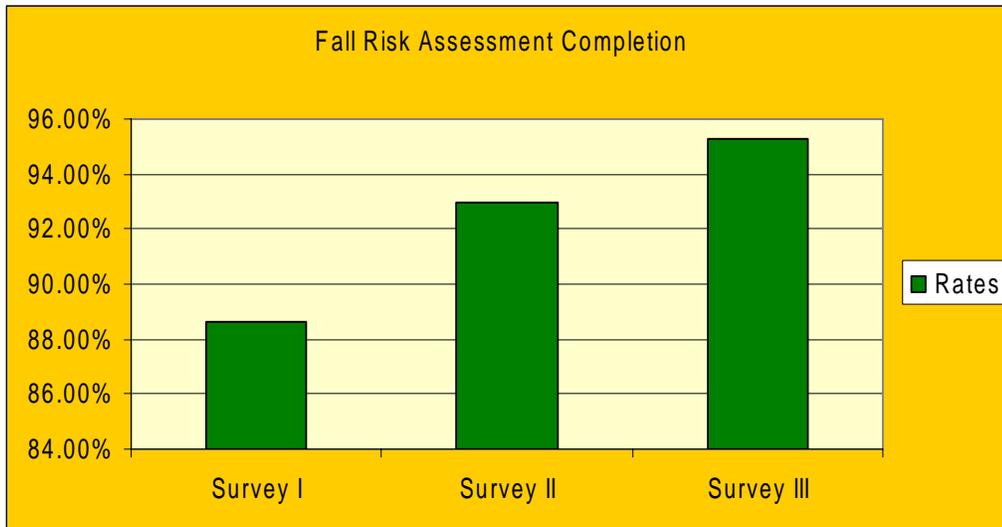


Figure 8. Fall Risk Assessment Completion

The present study used patient falls data from the Risk management department, Post Fall Report and Occurrence report. To better evaluate falls and pinpoint the environmental causes the patient falls are tracked on a monthly basis and the fall rate is calculated quarterly as the number of patient fallsx1000/number of patients' days. The fall prevention policy has been developed and implemented on April 2005, and on October 2005 were reported 3 falls. In April 2006, the policy was revised to incorporate the improved risk assessment tool and the new patient safety goals. In July 2006 were reported 24 falls, and in March were reported - 20 falls. In April 2007 the second month of our study were registered 8 falls (see Figure 9). In these two months of the study there was a decrease in number of patient falls from 20 in March to 8 falls in April. The decrease represents a difference of 12 falls between these two months. As we evaluated the data for 2006 we found an average of 13.6 patient falls /month. In March 2007, the most common cause of fall (32%) was attributed to dizziness. Other causes were: mobility deficiency, altered mental status, weakness, or in one of the cases the patient threw himself on the floor. Only 25% from those patients who fell were

over 65 years. In April 2007, 37% of the patients who fell were 80 years and older. The causes of fall were attributed to dizziness, disorientation, confusion, and sedation.

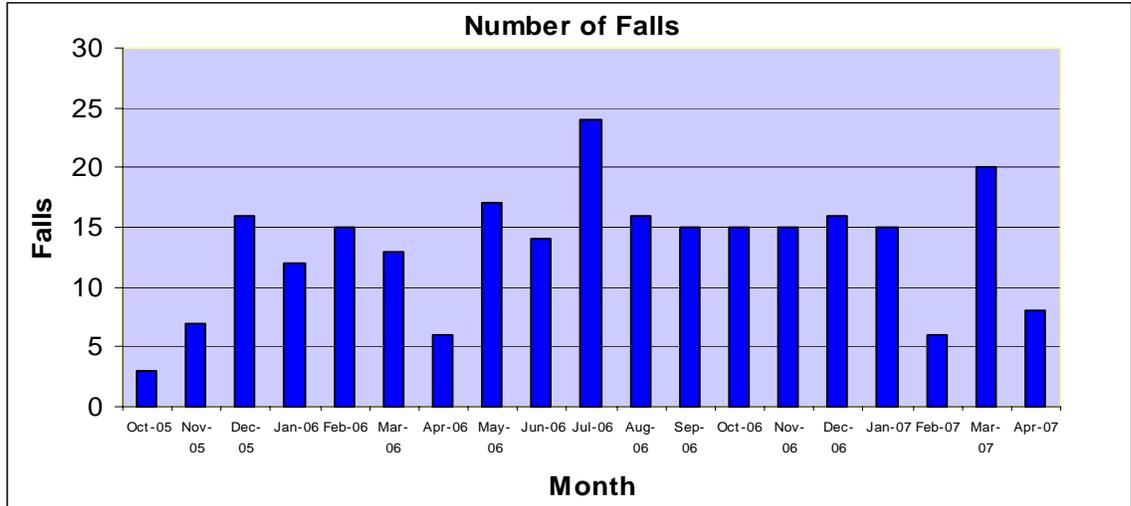


Figure 9. Patient falls in the hospital per month (October 2005 – April 2007)

The rates of reported falls per 1000 patient days in 2005 were slightly higher than in 2006. The Figure 10 presents the distribution of the patient falls quarterly. In 2005 were reported an average of 3.9 falls per 1000 patient days, and in 2006 the fall rate was 4.5 falls per 1000 days. There is an increase in the fall rate in the third quarter of 2006, which may be attributed to the nurses’ vacations in this period. To acknowledge the situation there will be necessary to perform a root analysis of the causes of falls, but this is not the topic of the present research.

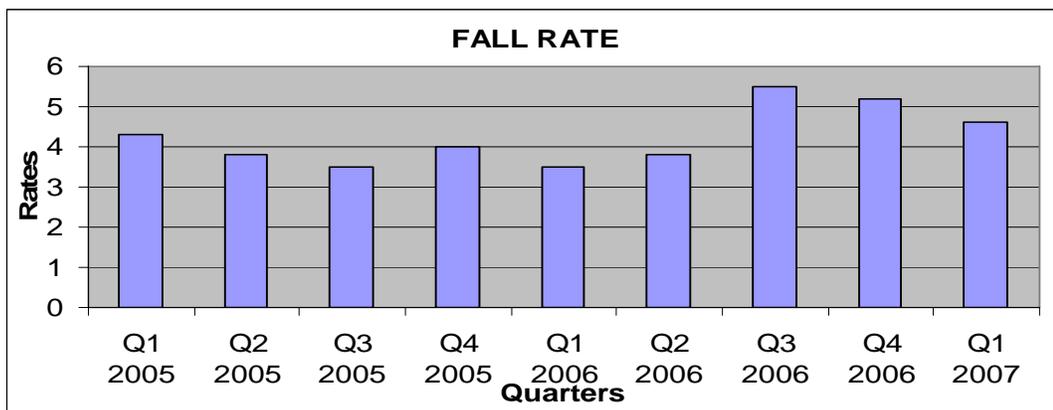


Figure 10. Distribution of the fall rate per 1000 patient days

The comparison between the results of other studies and the present paper is impeded by the differences in methods, fall definition, differences in study populations, and hospital services. While most of the studies and guidelines stressed over the importance of choosing an adequate risk assessment tool (Perell, 2002, Hendrich, 2006) only few of them evaluated the patients' screening process and tool utilization.

The literature reports that the fall risk assessment tool was utilized on a 75.5 % of cases, which was not meeting The Joint Commission's standard of 90% (Sullivan & Badros, 1999). Other researchers found that the fall risk assessment (The Hendrich II assessment tool) had a daily utilization of 88% and later on improved to 91% (Sulla & McMyler, 2006). A review study of the risk assessment tools has found that only two risk assessment tools – Morse Fall Scale (Morse, 1989) and STRATIFY (Oliver, 1997) fulfilled the criteria of prospective validation, using sensitivity/specificity analyses. They were tested in more than one population and they had good face validity (Oliver et al., 2004).

The most common approach used in literature to measure falls is the fall rate which is calculated as it follows:  $\text{Number of falls} \times 1000 / \text{Number of patient days}$ . The findings of the following studies are similar with the findings of the present study. There were differences in the average fall rate; they ranged from 4 falls per 1000 days, 4.43 falls, 5.75 falls, to 7.3 falls per 1000 days (McCarter-Bayer et al., 2005, Alcee & Mather, 2000, Sherrod & Good, 2006, Sullivan & Badros, 1999).

The average fall rate of The Mount Vernon Hospital for 2005 was of 3.9 falls per 1000 days; in 2006 – 4.5 falls per 1000 days; and in the first quarter of 2007 were encountered 4.6 falls per 1000 patient days. Another study reported the fall rate as the

mean number of falls per 100 beds. The study was conducted in nine hospitals. The researchers sought to determine the factors of patient falls and injuries. The researchers' found that the number of falls varied function of hospital's type, size and location. In an academic type hospital were recorded 94.5 falls per 100 beds in one year; in a small hospital (<250 beds) were occurred 69.1 falls per 100 beds. Also another difference was by location: in a rural hospital the outcomes were 46.8 falls per 100 beds, and in an urban or suburban the number of falls was 115.5 per 100 beds (Krauss et al., 2007, p. 545).

As a conclusion, the literature emphasized that in order to eliminate disparities in hospital systems it is vital that fall definitions should be standardized, reporting practices and fall classification be consistent, so that fall rates can be calculated, and rates compared to share successful methods of decreasing hospital falls.

## **Chapter V**

### **Analysis of Findings**

As we stated in a previous chapter our assumption was that there will be a correlation between the number of patient falls and compliance with the fall prevention policy. Therefore, we have evaluated and analyzed the patients at risk of falling, the plan of care instituted for those patients at risk, and the compliance of the nursing staff with the existing policy. We start our analysis with the most common causes of patient falls that emerged from our findings, the literature review followed by an analysis of the fall risk assessment.

#### **1. What are the factors that trigger falls?**

When we analyzed the data, we found that the highest proportion 32% of the patient falls were attributed to dizziness and the circumstances under these falls occurred were related to the bathroom use (25%). Also the most vulnerable to falls were older patients, particularly those over 80 years (37%). Our findings about age as a risk factor were similar to Tingle's (2007) review. Sherrod & Good (2006) analyzed the patient falls in a large, urban hospital on the medical surgical unit and they found that the most common cause of falls was toileting related (33%). In Alcee & Mather's (2000) study 30% of falls were related to the use of bathroom (the study took place in a community hospital). McCarter et al.'s (2005) research also found that 37% of the falls were toilet associated.

While more of the studies found that predominant are falls related with toileting there is one study that contradicts the overall data. Sullivan & Badros (1999) analyzed the

following factors of falls: bathroom issues, incontinence, mobility deficit, confusion. In the authors' study (in a hospital system, on four medical surgical units) the most common factor was the mobility deficit (57% of falls) and the second cause of falls was related with toileting (22%). The study's data was influenced by another factor that is patient's age. More than 50% of the patients were older than age 73.

The slight differences among those hospitals - 30%, 33%, 37% of patient falls could be attributed to the hospital's type, size, location, units, and differences in patient populations. The mobility deficit cause of falls in the medical surgical units was prevalent due to an increased percentage of 73 years and older population. Another study emphasized that those bathroom related falls could be reduced between 50% and 70% in most hospitals if a regularly scheduled toileting would be initiated and consistently applied by the nursing staff (Hendrich, 2006).

Although the age is the most common cause of patient falls, there are studies that contradict the overall findings. While some studies took in consideration and analyzed the patients age (Sullivan & Badros, 1999, Alcee & Mather, 2000), others reported that 54% of all patient falls occurred in patients under the age of 59 (Sherrod & Good, 2006). The full significance of age as a risk factor remains unclear.

Another cause which increases the patient risk of falling was the side effects of medications – benzodiazepines and epileptics. The literature analyzed their side effects and found that [26% (Alcee & Mather, 2000) and 28% (Sherrod & Good, 2006)] a high percent of the patients who fell had one or more of this medications administered. Alcee & Mather (2000) did not find a causal correlation between medications and falls.

## **2. What is the hospital's fall prevention policy toward interventions to prevent falls from occurring?**

To answer to this question we reviewed the internal documents of The Mount Vernon Hospital fall prevention policy (see Appendix A) and the risk assessment form (see Appendix B). According to Perell (2002) and Hendrich (2006) the fall risk assessment form (screening every patient) is the first step of a fall prevention program. The Mount Vernon Hospital and their counterparts Sound Shore Medical Center form together Sound Shore Health System. Their fall prevention policies cannot be compared because they have different methodologies at every site. The Mount Vernon Hospital fall prevention policy has been developed in April 2005 and implemented in July 2005. In 2006 the policy has been revised to incorporate the new patient safety goals and the new scoring (risk assessment points). The policy includes the standard of care, the fall definition, and the standard of practice which is comprised from an assessment, a fall risk reassessment and staff's education.

According with the policy the nursing staff should assess every patient on his/her admission and at specific intervals of time using a fall risk assessment form. This form should be completed within 12 hours of patient's admission. A total score of 8 or more points indicates that an individual is at risk of falling. Also patients with a history of fall or a physical limitation are considered at automatic risk of falling.

The staff uses the following visual identifiers for patients at risk: red identification wristband, helping hands magnet on the patient's door and a helping hands magnet on the patient's chart. The nursing staff is responsible for implementation of a plan of care for those patients at risk of falls (see Appendix A, The Mount Vernon Hospital policy). The

plan of care initiated by the nursing staff includes (but is not limited too) the following interventions:

- Patient will be moved closer to nurses' station
- Use of bed alarms
- Use of chair alarms
- Hourly monitor the patient at risk of falling
- One to one observation (companion or family) (The Mount Vernon Hospital policy, see Appendix A)

Other interventions were directed toward making the environment (safety checks) safer for those patients at risk. In certain situations the nursing staff was responsible to reassess the patient and update the risk assessment with the new score. These situations related to changes in mental status, in level of care or in case of a repeat fall. Based on the revised score, the nurse would make appropriate adjustments in the plan of care to prevent the potential fall.

An important part of The Mount Vernon Hospital policy emphasizes the staff's education. One of the staff responsibilities is to familiarize patient and family with the environment. The staff's education is an ongoing process throughout the entire year and it includes the orientation of all staff on fall prevention policy and procedure.

There are different fall prevention approaches in the analyzed literature. These approaches are developed, implemented and modified by the hospital's nursing staff, fall prevention teams or interdisciplinary teams. Several studies analyzed the fall prevention programs in hospital systems as a system wide program addressing the interventions at unit level. For instance, the fall prevention program was developed to target the increasing number of falls in the medical surgical units. Therefore, the nursing directors and managers from two hospitals worked together and implemented the same fall prevention program in their medical surgical units.

The fall prevention policy specified that the every patient should be assessed on the first 24 hours since admission and initiated a plan of care. An important step of the policy was that it required an incident report, in case of a fall, describing the event and injury (Sullivan & Badros, 1999).

One of the fall prevention approaches included the use of electronic devices on beds, ongoing patient assessments and evaluation of fall incidents, and focused training based on incidents. Those patients identified as being at risk were using wristbands and color-coded signs on charts and doors. The training of the nurses was directed to increase staff's competence, compliance and awareness (Jackson & Gleason, 2004).

Other fall prevention researchers (McCarter-Bayer et al., 2005, Sulla & McMyler, 2006) have implemented interdisciplinary fall programs in hospitals. One of these programs introduced a fall prevention protocol. The program focused the attention on the definition of fall (as being more than an accident), the use of the assessment tool, communicating the risk of fall (door sign, the use of call bell, wristbands) implementing individualized interventions and educating staff (McCarter-Bayer et al., 2005).

The interdisciplinary team stressed on the use of evidence based assessment tool with demonstrated effectiveness. They defined the components of the fall prevention program underlining upon the risk assessment and patient screening, organizational culture, communications and education (Sulla & McMyler, 2006).

Other researchers (Alcee & Mather, 2000, Sherrod & Good, 2006) analyzed their findings and found that assessing the staff's knowledge regarding falls and risk assessment tools has a great significance and the employees should be held accountable to act on the training they have received. Also in their opinion the education should be

mandatory and unit-based. After they analyzed the fall data, the protocol for prevention was more oriented toward developing individual patient plans with the patient and family's help. Krauss et al.'s (2007) study emphasized that hospital systems should have standardized definitions and the reporting process should be consistent within and among hospitals for a common purpose that is decreasing the number of falls.

Most of the studies do not include in the research the hospital's fall prevention policy but rather only parts of their interventions, and even if they would detail it there are only few similarities, which cannot be generalized.

### **3. How well is the hospital staff complying with the fall prevention policy?**

As we analyzed the data presented in the previous chapter, we found that at the beginning of our survey the fall risk assessment completion (first survey – 88.6%) did not meet The Joint Commission's standard (a 90% daily completion of the assessment). The Mount Vernon Hospital was using the risk assessment to screen the patient for risk of fall only in 88.6 % of cases. These results improved on the second (93%) and third survey (95.3%) from our research. This meant that the risk assessment utilization had increased 6.7%. The improvement was possible through one-on-one orientation of the nursing staff about steps in the risk assessment and clarification of few ambiguities.

According to the literature review, there are many risk assessment tools but only two are validated (Oliver et al., 2004). They are: Morse Fall Scale (Morse, 1989) and STRATIFY (Oliver, 1997). These risk assessment tools met the criteria of prospective validation, they had been tested in more than one population and they had good face validity. Oliver et al.'s (2004) opinion was that clinicians would be more productive if

they identify “common modifiable” (as reviewing medications, staffing levels, environmental safety, p. 128) risk factors in all patients. The authors of the study concluded that even better fall risk scores cannot predict all falls.

The Mount Vernon Hospital’s fall prevention policy requires that patients at risk should be identified through three recognized visual identifiers. From all patients at risk 62% were without a red ID wristband, and in 28% of the cases the fall visual identifiers (red sticker on patient chart and magnet on the patient door) were not in place. Although the hospital staff is not complying with their standard of care there is no evidence in the literature that using these identifiers will reduce the number of falls. Mayo et al.’s (1994) study evaluated the effectiveness of identification wristbands for patients in a rehabilitation hospital. The researchers found that wristbands were of no benefit in preventing falls. Landro (2007) emphasized in her article *Hospital Target Risks of Color Wristbands* that the identification bracelets (DNR wristbands, Fall Risk, Allergy, and others) instead of protecting patients they were actually increasing the risk of harm, endangering patients transferred between hospitals and confusing nurses and doctors who rotated among several hospitals. The wristbands are differing in color among hospitals. There are several hospitals that have formed groups to standardize color designations in their states ([www.online.wsj.com](http://www.online.wsj.com)).

The Mount Vernon Hospital’s interventions were not followed consistently with the policy. When we analyzed the data regarding the initiation of the plan of care for patients at risk of falls, the nursing staff failed to apply the necessary interventions. A higher percentage of the patients were not relocated (52%) closer to the nurses’ station. The reason for not relocating the patients was that there were not enough available rooms.

Also 94% of the bed alarms were not in place, which was another intervention the nursing staff failed to comply with the health prevention policy. The use of the chair alarms was not easy to assess, and it remained unclear whether the nursing staff included them at all as a method of intervention (a policy requirement). The Spetz's et al.'s (2007) trial demonstrated the effectiveness of a bed device (with sensors) in reducing the rate of patient falls. As a caveat, the trial was small in size (used only in a neurosurgery unit) and was financially supported by the provider. Jackson & Gleason (2004) used an electronic sensing device on beds as an intervention to fall prevention. There was a decrease in the use of the patient companions (they sit and observe the patient for 24 hour period). The patients companions were more costly compared to the bed monitoring system. Another intervention according with The Mount Vernon Hospital's policy was hourly monitoring the patient at risk of falling. This intervention was not carried out by nursing staff (in 46% of cases). According with other studies the hourly interventions should be reinforced in order to assure the patients' safety. Alcee & Mather's (2000) research, analyzed these checks and they emphasized holding the nursing staff accountable for assuring these rounds.

A significant part of The Mount Vernon Hospital fall prevention policy is the patient reassessment. This should occur when a patient encounters changes in the level of care, introduction of new medications, after a surgery, and after a fall. A small number of patients (5) were not reassessed. When we discussed with the nursing staff about the patients' reassessment, the reasons given for not completing the task were that the responsibility belonged to the previous shift, or patient was just admitted or transferred from another unit.

In case of an actual fall The Mount Vernon policy requires that patient should be reassessed, they do not mention that the nursing staff is documenting the patients fall in an Occurrence Report and on a Post Fall Report (which includes corrective actions). The most common corrective action after a patient fell was that hourly rounds were reinforced (17%), patient has been reminded to call for assistance (14%), and patient has been moved closer to the nurses' station (10%). After a patient has fallen, there is still an opportunity to reduce the degree of harm by detecting and treating injuries, and applying measures that could reduce the risk of further falls. In 39% of the cases the nursing staff had not complete a Post Fall Report, which meant they failed to initiate any interventions after a fall was happening.

#### **4. How effective has health policy interventions been in reducing hospital falls?**

The Mount Vernon Hospital reported an average of 3.9 falls per 1000 patient days (2005), an average of 4.5 falls per 1000 patient days (2006), and for the first quarter of 2007 an average of 4.6 falls. These fall rates were similar to findings from the reviewed literature, which used the same calculation of the fall rate (Alcee & Mather, 2000, McCarter-Bayer et al, 2005).

When we compare the data from 2006 to 2005 there is no evidence that the fall prevention interventions had been effective since there is an upward trend of 0.6 falls per 1000 patient days. In the literature we found only two studies where interventions were effective in reducing the fall rates (unit level- medical surgical units, not at the hospital level). Sullivan & Badros's (1999) study evaluated a fall prevention program in a health system. The fall program targeted the troublesome medical surgical units because they

had the greatest number of the patients at risk of fall. The interventions instituted by fall prevention team were successful, resulting in a decrease (in 1 year) of the fall rates from 9.3 to 7.3 falls per 1000 patient days at risk of fall.

Another example of effective interventions is Moore & Duncan's (1999) research. Their approach to falls was through multifaceted interventions. When a patient had an incident a team performed a root-cause analysis to better understand under what circumstances the falls were occurring and taking the appropriate measures. Although the hospital reduced the number of falls, they did not disclose specific numbers. The hospital's policy consisted of involving the staff at all levels in the fall prevention program. Nevertheless, these two studies succeeded to reduce the number of patient falls the fall prevention program and interventions were addressed at unit level. The fall prevention policy was not evaluated and analyzed for entire hospital.

When we analyze the number of falls/month for The Mount Vernon Hospital (Chapter IV, Figure 9) we noticed that there was an increase in July 2006 (24 falls). We may suppose that the increase in the number of falls could be attributed to the nurses' vacation in this period and the temporary nurses had not been trained adequately in fall prevention. The analysis of these increases may be a topic of another study, to pinpoint the real causes of falls. On March 2007 (20 falls) had been recorded, the second greatest increase in the number of falls since the program's implementation in 2005. This was the first month of our study, and therefore we may assume that more falls had been reported as an increase in staff awareness. The spike in falls was not related to a higher number of patients admitted in this period (8940 patients in the first quarter of 2007). In April 2007 we had only 8 falls this meant there was a decrease of 12 falls from March to April 2007.

Using descriptive analysis we demonstrate the causal relation between the number of falls and the compliance with the health policy. One study found that when the fall program remained without supervision for three months, the number of falls escalated from 1 fall in the first month to 13 falls in the following month. When a manager was hired and the program stabilized the number of falls decreased (Sherood & Good, 2006).

We used McGregor's Theory X to make observations about the nursing staff interventions toward fall prevention. According to his theory:

- The average human being has an inherent dislike of work and will avoid it if he can.
- Because of this human characteristic...people must be coerced, controlled, directed...to put ...effort toward the achievement of organizational objectives.
- The average human being prefers to be directed, wishes to avoid responsibility... (Denhart, 2004, p. 92).

In our research, when the nursing staff was observed (during the evaluation of the policy) the outcomes were positive (the number of falls decreased from 20 in March to 8 in April 2007). We may assume that the staff awareness increased as a result of the observation, orientation one-on-one and the nursing managers' involvement in the staff's education.

This study has shown that the analysis of patient falls at The Mount Vernon Hospital has proven useful to the hospital in two important ways. First of all nursing staff gained better knowledge of the nature and prevalence of risk factors for falls and which units have the highest number of patients at risk. The study is also important to help understand the concern in the treatment of fall patients and the needed changes in the hospital prevention policy. Our study and the literature review (Sullivan & Badros, 1999, Sherood & Good, 2006) revealed that certain units (medical surgical) had the greatest percentage at risk of fall patients. These units were the two medical surgical units (22%

and respectively 17% of the patients at risk of fall). This requires the development of a specific program for these units, to include increase awareness among the nursing staff to prevent falls from occurring. The most common cause surrounding falls was attributed to dizziness (35%) and the circumstances to these falls were associated with the use of bathroom (25%). Our findings are confirmed by the findings in the literature review (Sullivan & Badros, 1999, Alcee & Mather, 2000, Krauss et al., 2007). This analysis enables us to profile the level of fall risk among patients and allows for the development of interventions that respond to the needs of patient populations (causes of falls are different in different units). The analysis of our findings determined where the weaknesses in The Mount Vernon Hospital fall prevention policy are, and identified future opportunities for improvement in the program.

## Chapter VI

### Conclusions and Recommendations

Over the years, intensive efforts have been made to improve knowledge and increase staff awareness about falls, fall prevention programs and interventions aimed to reduce the number of falls. Although much work has been done in attempting to evaluate the fall prevention program and to assess the nursing staff's interventions in The Mount Vernon Hospital, further work is needed. According to the literature review findings and our analysis of the data we may outline that a good approach to fall prevention program should be:

- Using a tested (validated) risk assessment form to identify the patients at risk of falling (as each patient is affected differently by the interplay between a range of risk factors).
- Based on multifaceted interventions (individualized interventions, reviews of medications, detecting and treating incontinence, improvements to call bell, hourly checks).
- Developed by an interdisciplinary fall prevention team that includes nurses, dietitians, physicians, psychiatrists, pharmacists, and others.
- Including education of staff members and patients' families (staff's education should be ongoing process to keep the program alive).

The results from our analysis suggest that a better practice for The Mount Vernon Hospital should be to have a standardized policy and procedure together with their counterparts Sound Shore Medical Center. Several of The Mount Vernon Hospital units

have the fall risk assessment on their intranet, but the fall data is not available to all staff regardless of the unit they are working. Furthermore, the falls should be presented in graphs (chronological order) and this would allow the staff to implement strategies specific to units (oriented toward problematic units), or individualized to the patients needs. By analyzing the trends and variances in the fall data the staff could better understand the complexity of the process and the factors that can trigger a fall to occur.

In order to prevent falls from occurring the hospital's fall prevention policy should identify and implement interventions according to individual patients' needs. The fall prevention should be made a priority for all staff not just for the nursing staff. The vital part in the fall prevention is that after an evaluation of all components of the process the hospital has to implement the changes or modifications in response to the initial evaluation. One of the recommendations in the literature outlined that in order to decrease the number of falls the health systems (together with Sound Shore Medical Center) should have standardized definitions and moreover the reporting process (number of falls, fall rates) should be consistent within these hospitals.

In order to be effective in reducing the hospital falls the interventions should be unit-based and more specific patient-centered. Whenever a fall is occurring an interdisciplinary team should conduct an investigation. Performing this investigation could identify contributing causes such failure to follow procedures or the existence of unsafe conditions. By understanding the real causes the staff could find ways to implement interventions that would be effective in preventing future occurrences or reducing the hospital falls. In case of failure to follow procedures the staff should be trained in fall prevention.

Education of all nursing staff should be a priority. The following terms should be reinforced: hourly rounds for these patients at high risk of falling, risk assessment, plan of care (interventions implemented by the nursing staff), and patient reassessment. Moreover, managerial support (at all levels of the hospital) is necessary to ensure that fall prevention is embedded in practice.

The staff awareness increased regarding the importance of the risk assessment completion and the adequate interventions that the nursing staff initiates. Still further work is needed to improve the communication about the fall prevention process among the employees, thereby influencing The Mount Vernon Hospital's culture and increasing the chances of success. The literature review highlighted that hospitals should be encouraged to share the fall rates information because this can contribute to developing benchmarks. By comparing rates among them hospitals could strive together in following the ultimate goal of the fall prevention policy these are increasing patient safety and reducing patient falls.

The findings of our study could be applied only to The Mount Vernon Hospital, because they relate to a specific part of the fall prevention policy. We highlighted that weaknesses in the current fall prevention policy have been discovered (and we may pinpoint them) and the next step would be to modify and change parts that do not work effectively. Though this study placed emphasis on the fall prevention policy interventions, we cannot conclude that the findings could be generalized to other organizations than the one we studied. A further study could be an in-depth analysis of the causes of falls, as they are directly related to the interventions nursing staff should apply. Another study

could be about post falls interventions and degree of injury a patient has suffered.

Further study could be about claims involving alleged damages from a fall incident.

This project has been valuable because every hospital is caring for different patients in different environments, so analyzing and reviewing local data to take local action is essential. This project has been valuable because it specifically focuses on a very small part in a complex process of fall prevention. Furthermore, to assure the program effectiveness it is crucial to have: leadership support; education to be a priority at all levels; staff with experience in problem solving; and teamwork. All these could concur to provide a safe environment for the delivery of care to potential fall patients.

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