IDENTIFYING ELDERLY PATIENTS AT RISK TO FALL UTILIZING NURSES' ASSESSMENTS AND THE MORSE FALL SCALE

by

Carol Maureen Schick

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Carol M. Schick

DEDICATION

In memory of my father, Theodore C. Schick.

To my mother, Thelma Schick.

ABSTRACT

Patient falls contribute to patient morbidity and mortality, extend the length of hospitalization, increase health care costs, and impact negatively on the quality of care provided by acute care facilities. The purpose of this descriptive study was to determine nurses' knowledge of the risk factors associated with patient falls and to ascertain nurses' ability to identify patients at risk to fall. The study also utilized a fall scale instrument to identify patients at risk to fall, and examined patient falls, the outcome of interest in the study. The conceptual framework was based on the structure - process - outcome paradigm proposed by Donabedian for evaluating the quality of health care, and the Roy Adaptation Nursing Process. Non-probability sampling was used to select a sample of 20 surgical and 20 medical patients, admitted to an acute care hospital setting. Data were collected using patient records, nursing care plans, and the Morse Fall Scale. Data were analyzed using qualitative and quantitative analysis, including content analysis and descriptive statistics.

The findings indicated that nurses assessed and documented risk factors associated with patient falls on an ongoing basis throughout patients' hospitalization, but rarely used this assessment data to identify patients at risk to fall. Nurses had particular difficulty in assessing

and documenting behaviors related to mobility and gait, and mental status.

Patients were considered at risk to fall on more than 70% of the days spent in hospital when the Morse Fall Scale and a score of 16 were used to establish fall risk. Three patients fell on a total of six occasions during the study. The Morse Fall Scale would have predicted 83.3% of these falls if the score used to establish fall risk had been increased to 45 or more. The Morse Fall Scale therefore appeared to offer hope as a means of identifying patients at risk to fall in an acute care hospital setting.

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CHAPTER I: INTRODUCTION

Statement of the Problem

Patient falls comprise the largest single category of adverse occurrences in acute care hospital settings, accounting for 32 to 84% of all reported inpatient incidents (Fife, Solomon, & Stanton, 1984; Innes & Turman, 1983; Morgan, Mathison, Rice, & Clemner, 1985; Swartzbeck, 1983). Lynn (1980) reported that 2% of all patients admitted to hospital would fall at least once during their admission. Morse, Morse, and Tylko (1986) reported a mean fall rate of 2.5 falls per 1,000 patient bed days among all patients admitted to a large urban hospital over a 10 year period. Patients admitted to that facility therefore had a 1:40 chance of falling during an average 10 day hospital stay. Falls occur despite the existence of environmental safety standards, policies and procedures to guide practice, and ongoing quality assurance monitoring programs. Despite the magnitude of the problem, there has been little systematic research into the problem of patient falls.

Illness factors make all hospitalized patients vulnerable to the risk of falling, and of suffering an injury as a result of the fall. Elderly patients are at particularly high risk to fall because of their greater propensity to develop drug toxicities and drug interactions

and because of the physiological and psychological factors which accompany aging (Tideiksaar & Kay, 1986). In 1981, persons over the age of 65 made up just under 10% of the population in Canada but used 48% of the patient days in short term health care facilities. Manitoba was one of three provinces with the greatest number of persons aged 65 and over as a percentage of the total population. Demographic trends indicate that by the year 2030, persons aged 65 and over will comprise 14 to 17% of the population (Canadian Medical Association, 1987). Falls will continue to be a major problem among these elderly persons when they are admitted to hospital unless ways of preventing, or at least reducing, patient falls can be found.

Falls in acute care hospital settings involve high costs to the patient and family, the facility, and society. Falls cause pain and suffering, and are often the indirect cause of death due to complications which develop following prolonged periods of immobilization after a fall (Tideiksaar & Kay, 1986). Morse, Prowse, Morrow, and Federspeil (1985) reported that 26.5% of patients who fell suffered minor injuries including lacerations, abrasions, and contusions, while a further 3.6% of patients suffered major injuries including concussion, fractures, and wound dehiscence. The rate of injury is even higher in elderly patients. Clark (1985) reported that 53% of patients over the age of 65 who

fell in hospital sustained injuries, and 8% of these injuries were considered consequential.

Hip fractures are one of the most common and serious injuries resulting from a fall. The incidence of hip fracture increases markedly after the age of 70, and females, because of osteoporosis, are particularly vulnerable to this type of injury (Danish Medical Bulletin, 1987). The injury is painful, and the treatment, usually surgical intervention, extensive. Each hip fracture increases the length of stay in an acute care facility by an average of 21 days, longer than for any other diagnosis (Baker & Harvey, 1985). Hip fractures are also a leading cause of disability among the elderly. Many elderly persons never regain their pre-fall functional status following a hip fracture (Danish Medical Bulletin, 1987).

Even falls which do not cause physical injury can have devastating psychological effects. The feelings of insecurity which follow a fall, and the fear of falling again, can lead to a loss of independence and decreased mobility, and in some cases necessitate admission to a long term care facility (Danish Medical Bulletin, 1987; Rhymes & Jaeger, 1988). Hospital staff may resort to the use of physical or chemical restraints in patients who have fallen as a means of preventing further falls. Whether or not restraints prevent falls is a highly debated topic. At the very least, restraints cause physical and mental

deterioration, decreased mobility, and violate the individual's freedom and sense of dignity (Blakeslee, 1988; McHutchion & Morse, 1989; Rhymes & Jaeger, 1988).

The physical and emotional trauma which occur as a result of a fall in hospital can extend the acute care admission or necessitate admission to a long term care facility. Both substantially increase health care costs and place heavy demands on health care resources (Danish Medical Bulletin, 1987). The costs to the individual patient and family in terms of decreased mobility, reduced independence, and major lifestyle changes cannot be measured (Baker & Harvey, 1985).

Health care facilities incur direct and indirect costs as a result of patient falls. Patients enter health care facilities with the expectation that they will receive safe and adequate care. Patient falls may cause the patient and family to seriously question the quality of care provided by the institution. Where injury or death occur as a result of a fall, the patient or family may decide to take legal action against the hospital. The facility may then face increased liability claims and premiums as a result of such action (Clark, 1985; Fife et al., 1984; Hendrich, 1988; Tack, Ulrich, & Kehr, 1987).

Numerous investigators have examined patient falls in their respective facilities. The focus has been on reporting institutional fall rates, the characteristics of

patients who fell, the conditions under which falls occurred, and the consequences or outcomes of the falls. The results, although largely inconclusive and noncomparable across the various settings, agreed on one point. Identification of patients at risk to fall was the key in any program to reduce or prevent patient falls. Several investigators used the findings from their studies to develop falls risk factor checklists and fall scale instruments to assist staff in identifying patients at risk to fall.

Nurses must assume a key role in any attempts to reduce or prevent patient falls since they are the only group of health care professionals who are in constant contact with patients throughout their hospitalization. Patient safety is one component of nursing care. Patient falls adversely affect the quality of that care. Reducing, or preventing patient falls, is therefore a logical outgrowth of nursings' commitment to patient safety and quality nursing care (Maciorowski et al., 1988; Spellbring, Gannon, Kleckner, & Conway, 1988).

Most acute care facilities have not adopted fall scale instruments for nurses to use in identifying patients at risk to fall. It is assumed that nurses are familiar with the risk factors associated with falls and are able to identify the fall-prone patient (Janken, Reynolds, & Swiech, 1986). This may not be the case. Rainville (1984) reported

that "efforts to recognize patients at risk for falling ... took a variety of forms and were inconsistently applied by nursing units and even by individual nurses on the same unit" (p. 287). Walshe and Rosen (1979) questioned nurses' ability to accurately assess patients in regard to ambulatory and mental status, and Clark (1985) concluded that improved accuracy in assessing ambulatory and mental status, especially in elderly patients, would prevent, or at least bring about a significant reduction, in the number of patient falls.

To date there have been no studies to determine what nurses know about the risk factors associated with falls or to determine how they apply this knowledge in the clinical setting. Because patient falls continue to occur with alarming regularity, it may be that nurses lack the knowledge and skills needed to accurately identify patients at risk to fall. The purpose of this study was therefore to: (a) assess nurses' knowledge of the risk factors associated with patient falls; (b) assess nurses' ability to identify patients at risk to fall; (c) utilize the Morse Fall Scale (Morse, Morse, & Tylko, 1986) to identify fall-prone patients; and (d) examine the potential of each method for identifying patients at risk to fall. Lastly, the study was designed to examine patient outcomes, in terms of falls, among study subjects. A study which explores nurses' ability to identify patients at risk to fall is an

important first step in reducing or preventing patient falls. The reduction or prevention of patient falls through improved identification of high risk patients would ultimately result in an increased quality of care within the institution and an improved quality of life for the fall-prone patient.

Summary

Patient falls contribute to patient morbidity and mortality, extend the length of hospitalization, increase health care costs, and impact negatively on the quality of care provided by the institution. This study explores nurses' ability to identify patients at risk to fall, a critical first step in reducing or preventing falls in health care facilities.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

Falls are a common occurrence among elderly persons. Tideiksaar (1989) reported that 30 to 50% of older persons, when questioned, reported a recent fall or a liability to fall. The literature is therefore replete with articles documenting the reasons older people fall and the incidence of falls among the elderly living in the community. Because falls continue to occur when the elderly are admitted to acute or long term care facilities, there has been a proliferation of literature related to falls in institutionalized populations over the past three decades. This interest in patient falls is no doubt the result of increased emphasis on quality assurance, and concerns about fall-related injuries and the costs of treating them (Raz & Baretich, 1987).

The emphasis of the institution-based fall studies has been on the identification of fall rates, injury rates, and the patient and situational variables surrounding falls. The recurrent theme throughout the literature was on the early identification of patients at risk to fall so that interventions to reduce, or prevent, patient falls could be implemented. The accuracy with which patients are identified as being at risk to fall received little

attention in the literature and thus gave rise to the present study. This review will address the following: (a) the reasons older people fall; (b) studies of falls in institutionalized persons with an emphasis on the studies carried out in acute care facilities; (c) weaknesses inherent in these studies; and (d) the development of instruments to identify patients at risk to fall.

The Reasons Older People Fall

Falls in the elderly result from a combination of age related physiological and psychological changes, drug toxicities, pathological disease states, and environmental hazards. Tideiksaar (1989) stated that it was critical to understand the reasons older people fell because any attempts to reduce or prevent falls was highly dependent upon knowing and correcting the factors responsible for falls in these individuals. Gait, posture, and balance are the mechanisms by which individuals maintain an upright posture and move about efficiently. The maintenance of these functions depends upon the visual, vestibular, and proprioceptive systems. Input from these primary systems is processed through the central nervous system and the effector mechanisms, which includes the peripheral nerves and the musculoskeletal system. Disruptions in any of these systems, caused by disease or the aging process, can

interfere with balance, thereby causing postural instability and the potential for falls (Danish Medical Bulletin, 1987; Rhymes & Jaeger, 1988; Wolfson, Whipple, Amerman, Kaplan, & Kleinberg, 1985).

The normal aging process produces physiological changes within the eye that result in decreased near vision and visual acuity, decreased peripheral and night vision, altered depth perception, decreased ability to discriminate colors of similar densities, and increased susceptibility to glare (Tideiksaar, 1989; Tideiksaar & Kay, 1986). As a result of these changes, elderly individuals are less able to detect environmental hazards.

Gait patterns change with age. Men develop a wide-based shuffling gait and women, a narrow-based waddling gait. Both result in decreased steppage height and decreased stride length. Increased body sway after the sixth decade produces postural instability. Decreased muscle strength and tone, impaired muscle control, slowed reaction times, and a loss of righting reflexes further increase the probability that older individuals will suffer a fall if anything disturbs their balance (Rubenstein & Robbins, 1984; Tideiksaar & Kay, 1986).

The ability to concentrate becomes more difficult with advancing years and may be further impaired by depression, anxiety, or grief. These, in combination with hearing loss, may make elderly individuals less aware of environmental

hazards. Impaired judgement and memory loss may cause the elderly to lose sight of their limitations, or simply to forget or deny that they are unable to do everything they once did (Rodstein, 1964; Schulman & Acquaviva, 1987; Tideiksaar & Kay, 1986).

Aging can also interfere with the body's ability to absorb and excrete drugs. As a result, side effects and toxic levels can develop. These can alter level of consciousness, disrupt balance and coordination, and thus contribute to falls in the elderly (Rubenstein & Robbins, 1984; Spellbring et al., 1988).

Diseases of the cardiovascular, musculoskeletal, neurologic, sensory, metabolic, gastrointestinal and genitourinary systems frequently accompany aging and place elderly persons at increased risk of falling. It is estimated that between 20 and 30% of the elderly population have orthostatic hypotension. Persons with diabetes or Parkinson's disease may have orthostatic hypotension secondary to autonomic nervous system dysfunction. Orthostatic hypotension can also be caused by large venous varicosities, hypovolemia, low cardiac output, dehydration, electrolyte imbalance, and drug therapy. Orthostatic hypotension is believed to be the reason behind many falls in the elderly. Cough, defecation, and micturition syncope can also contribute to falls by producing a sudden, severe drop in blood pressure. Other falls in the elderly have

been attributed to acute changes in cardiac rhythm and decreased cerebral circulation. Cerebrovascular disease, seizure disorders, dementia, and Parkinson's disease are among the major causes of falls due to neurological dysfunction in the elderly (Chipman, 1981; Rubenstein & Robbins, 1984; Tideiksaar & Kay, 1986).

Cataracts and glaucoma, common eye disorders in the elderly, result in decreases in visual function beyond that attributed to normal aging. Electrolyte imbalance, anemia, hypoglycemia, hypothyroidism, muscle weakness, arthritis, and foot problems are other disease processes which can increase the risk of falls in elderly persons (Rubenstein & Robbins, 1984; Tideiksaar & Kay, 1986).

Environmental hazards contribute to falls in many elderly persons. Irregular ground surfaces, improper footwear, and loose or slippery ground surfaces do not permit good foot-ground contact. Cluttered rooms, unstable furniture, and poorly maintained equipment fail to provide the room and the support that the elderly require to manoeuvre safely. Inadequate illumination potentiates the visual deficits already present in many elderly persons and causes them to misjudge distances or fail to recognize unsafe situations. The absence of safety rails, particularly on stairways and in bathrooms, makes it difficult for the elderly to maintain their balance when negotiating different levels or changing positions (Danish

Medical Bulletin, 1987; Gray-Vickrey, 1984; Tideiksaar & Kay, 1986).

In summary, falls are not part of the normal aging process. However, a variety of age-related physiological and psychological changes, drug toxicities, pathological disease states, and environmental hazards interact to place older persons at high risk to fall. Any situation which compromises the balance functions of the visual, vestibular, and proprioceptive systems interferes with the end organ functioning of the musculoskeletal system and may cause falls (Danish Medical Bulletin, 1987).

Falls Among Institutionalized Populations

Most data on falls has been acquired through the study of institutionalized individuals, particularly the elderly. Investigators have examined falls in diverse populations in a variety of settings. For the most part these studies are empirical impressions of the patient characteristics and environmental factors which contributed to falls. Most relied on the retrospective analysis of hospital incident reports and patient records to establish this information. The underlying belief in each of the studies was that patient falls could be reduced or prevented if a profile of the individuals most at risk to fall could be established.

The studies are reviewed under four broad headings: a) patient characteristics; b) incidence of falls in institutionalized populations; c) injuries sustained as a result of falls; and d) situational variables surrounding patient falls.

Patient Characteristics

Age, gender, medical diagnosis, a history of previous falls, physical status including the use of ambulatory assistive devices, mental status, and medication usage were frequent risk factors examined in studies of patient falls in acute and long term care facilities. The findings from those studies are presented in this section. The emphasis is on studies carried out in acute care facilities. However, some references are made to studies conducted in geriatric and long term care facilities, since the age of the population in those facilities closely resembled the population of interest in the present study.

Age and gender. Most investigators agreed that the tendency to fall increased with age. What was less clear from the literature was the specific age at which patients became high risk to fall. Morris and Isaacs (1980) reported the greatest number of falls in patients 75 to 84 years of age in a geriatric hospital in England. Patients of the same age had the highest ratio of falls per patient day in a

Veterans Administration Medical Centre in the United States (Berryman, Gaskin, Jones, Tolley, & MacMullen, 1989).

In general hospital settings, Fife et al. (1984) reported that patients between 71 and 80 years of age were most likely to fall. Walshe and Rosen (1979) found that 83% of the patients who fell from bed were 65 years of age and over while this group represented only 22% of the entire patient population. Morse, Prowse, et al. (1985) reported a greater number of falls in patients between 65 and 79 years of age and indicated that "this proportion was significantly higher than the proportion of older patients admitted to the hospital during the year" (p. 117).

The studies failed to establish a clear relationship between patient gender and the tendency to fall. Male patients were at higher risk to fall in geriatric hospitals in Denmark and Wales (Sehested & Severin-Nielsen, 1977; Tinker, 1979). However, females were at increased risk to fall in a geriatric hospital in England (Morris & Isaacs, 1980).

Manjam and MacKinnon (1973), Clark (1985), and Morgan et al. (1985) reported that males fell more often than females in their respective acute care facilities in Canada, Australia, and the United States. Weil and Parrish (1958) reported that males had an accident rate more than double that of females in another large acute care hospital. However, Morse, Prowse, et al. (1985) and Lund and Sheafor

(1985) reported no statistically significant differences in male and female fall rates when the sex distribution within the facility was taken into consideration.

Medical diagnosis. Falls in all health care facilities were more common among patients with cardiovascular, neurological or cerebrovascular disorders, dementia, and cancer.

Jarvinen and Jarvinen (1968) and Walshe and Rosen (1979) found cardiovascular disease to be the most common diagnosis in patients who fell out of bed in acute care facilities. Morse, Prowse, et al. (1985) reported that 42% of patients who fell had a primary diagnosis of trauma or disease of the nervous system and that cardiovascular disease was the most frequently cited secondary diagnosis. Barbieri (1983) also found that a large number of patients who fell (48%) had a primary or secondary diagnosis of cardiovascular disease.

Swartzbeck and Milligan (1982) reported that approximately 50% of all accidents in hospital involved patients with a diagnosis of cerebrovascular disease. Other investigators reported that approximately 40% of patients who fell in rehabilitation settings had an admitting diagnosis of cerebrovascular accident (Mayo, Korner-Bitensky, Becker, & Georges, 1989; Mion, Gregor, Buettner, Chwirchak, Lee, & Paras, 1989).

Lynn (1980) and Barbieri (1983) reported cancer, especially in its advanced stages, to be prevalent among the patients who fell in their respective facilities. Dementia was common among patients who fell in a geropsychiatric unit and a long term care facility (Hernandez & Miller, 1986; Johnson, 1985). Catchen (1983) reported that organic mental syndrome or stroke was the primary diagnosis in 40% of the elderly patients who suffered repeated accidents in an acute care facility.

Lund and Sheafor (1985) concluded that there was no significant difference between patients who fell and a control group who did not, based on the number of disease conditions or the primary diagnosis at discharge. Tinetti, Williams, and Mayewski (1986), however, reported that falls occurred when multiple disabilities, involving multiple functions, began to interfere with the person's ability to compensate.

History of falls. A history of falling was strongly associated with increased fall risk throughout the literature. Sehested and Severin-Nielsen (1977) reported that 40% of patients who fell in a geriatric hospital in Denmark had experienced a previous fall, and that this group accounted for 70% of all falls in this facility. Berry, Fisher, and Lang (1981) found that 50.9% of patients fell more than once, and accounted for almost 80% of all falls in a geriatric hospital in Toronto.

Between 8 and 26% of patients who fell in acute care hospital settings did so on more than one occasion (Lynn, 1980; Lund & Sheafor, 1985; Morgan et al., 1985; Morse, Prowse, et al. 1985). Hart and Sliefert (1983) suggested that multiple falls were the result of the patients' desire to maintain their independence. Regardless of the reason, a history of falling was a strong predictor of future falls throughout the literature.

Mental status. A number of investigators examined the relationship between mental status and falls. The results were inconclusive. Clark (1985) and Morse, Prowse, et al. (1985) reported that approximately 60% of patients who fell in acute care hospital settings were considered to have a normal mental status. Lund and Sheafor (1985), on the other hand, found that cognitive impairment, including senility, confusion and episodic confusion, was significantly related to fall risk in a study that included a control group. Confusion was also found to be a significant fall risk variable in a study carried out by Janken et al. (1986). Berryman et al. (1989) concluded that patients who had periodic intervals of confusion and orientation were more liable to fall than patients who were consistently confused.

Walshe and Rosen (1979) reported an almost equal distribution of normal and disoriented behaviors in patients who fell out of bed. This led them to suggest that nursing assessments of the patients' mental status were inaccurate,

because, if in fact 50% of the patients had a normal mental status, they should have had "the presence of mind to wait, or ask for assistance" in getting out of bed (p. 33). Clark (1985) also questioned the accuracy of mental status assessments and suggested that improvements in these assessments, particularly in elderly patients, could prevent, or at least significantly reduce, patient falls.

Physical status. Investigators reported a number of functional deficits, including visual and auditory impairments, general weakness and debility, incontinence, orthostatic hypotension, and elevated temperature, in patients who fell in acute and long term care facilities (Barbieri, 1983; Hernandez & Miller, 1986; Janken et al., 1986; Sehested & Severin-Nielsen, 1977; Tinetti et al., 1986). However, the most common deficits among patients who fell were those which interfered with their gait, balance, and posture.

Motor deficits, decreased mobility of the lower extremities, and difficulty with locomotion were factors which contributed to patient falls in studies carried out by Barbieri (1983), Coyle (1979), Janken et al. (1986), and Lynn (1980). Hernandez and Miller (1986) concluded that an unsteady gait and poor balance contributed to falls in a geropsychiatric setting, and that the risk of falling was increased in patients who denied the need for assistance. Morse, Tylko, and Dixon (1987) reported that 60% of patients

who fell had a weak or impaired gait compared to only 36% of patients in the control group who did not fall. Walshe and Rosen (1979) and Clark (1985) questioned nurses' ability to accurately assess mobility and activity status, since approximately 50% of the patients in their respective studies were assessed as being nonambulatory or in need of assistance to ambulate, yet failed to seek this assistance prior to ambulation, and consequently fell. Finally, Tinetti et al. (1986) reported that balance and gait testing were useful in differentiating elderly residents who fell repeatedly from those who fell only once or not at all.

The literature was less clear regarding the role that ambulatory assistive devices played in contributing to, or preventing, patient falls. Lynn (1980) and Lund and Sheafor (1985) reported that the use of wheelchairs, walkers, and canes increased the risk of falls. Kalchthaler, Bascon, and Quintos (1978) found that differences in fall rates depended on the type of assistive device used by nursing home residents. Those who were dependent on wheelchairs had the greatest number of falls while those who used canes or walkers had the lowest number.

Medication usage. Patients who fell in the studies reported in the literature were receiving a number and variety of medications. Barbieri (1983) reported that patients were receiving diuretics, hypnotics, tranquilizers, analgesics, and barbiturates at the time of the fall.

Walshe and Rosen (1979) found that patients who fell from bed were taking diuretics, cardiac medications, sedatives, and narcotic analgesics. Clark (1985) reported that 19% of patients who fell had received diuretics within the previous 12 hours, and 35.1% had received narcotics or sedatives in the previous 12 hours. Lund and Sheafor (1985) found that patients taking vitamins and iron, antihypertensive agents, diuretics, and seizure medications were at increased risk to fall. Morse, Prowse, et al. (1985) reported that 65.6% of patients received some medication within one hour before their fall. Analgesics, psychotherapeutic agents, gastrointestinal and cardiovascular drugs were the ones most often administered in this study. Berry et al. (1981) reported that 2.2% of falls were associated with alcohol use in a geriatric hospital.

While investigators generally agreed that medications increased the risk of falling in older patients, the extent to which, and the mechanism by which they contributed to falls were less clearly defined. Weil and Parrish (1958) reported that sedatives, narcotics, stimulants, and other drugs contributed to 5%, and anaesthetics to 3% of all the accidents in a large acute care facility. Sehested & Severin-Nielsen (1977) reported that although 40% of patients who fell received hypnotics or tranquilizers, these medications were judged to have contributed to only 5% of all the falls. Davie, Blumenthal, and Robinson-Hawkins

(1981) indicated that while any drug increased the risk of falls, the administration of three or more drugs carried a significantly higher risk. Kalchthaler et al. (1978) also concluded that falls were directly related to the administration of three or more drugs in nursing home residents. Macdonald (1985) reported that combinations of drugs increased fall frequency more than individual drugs, and that the administration of some drugs in specific disease entities appeared to be particularly dangerous. He also reported that alcohol could be a major contributor to falls in elderly patients with impaired proprioception, poor eyesight, or cardiac disease.

Tideiksaar (1989) reported that the mechanism by which medications contributed to falls included hypovolemia and loss of postural control (diuretics), orthostatic hypotension (antihypertensives), impaired cognition (hypnotics, sedatives, tranquilizers, and psychotropics), and cardiac arrhythmias (cardiotonic agents, diuretic-induced hypokalemia).

Incidence of Falls in Institutionalized Populations

Fall rates in acute care facilities have not been consistently reported in the literature. Weil and Parrish (1958) reported a rate of 28.5 accidents per 1,000 patients admitted to a large teaching hospital in New York, where falls comprised 83.5% of all adverse occurrences. The rate

of accidents was consistently higher in patients 60 years of age and over. Twenty-five years later, Catchen (1983) reported that the accident rate for all patients admitted to a large municipal hospital in New York City was 33 per 10,000 patient days. This figure rose to 53 accidents per 10,000 patient days in patients aged 65 and over. Falls comprised 79% of all accidents in this facility.

Manjam and MacKinnon (1973) studied only falls and reported a rate of 10 per 1,000 patients at risk among all patients admitted to a general hospital in New Brunswick. More recently, Morse, Black, Oberle, and Donahue (1989) reported rates of 2.5 and 3.2 falls per 1,000 patient bed days in a 1,100 bed general hospital and a 240 bed rehabilitation hospital in Alberta.

Other investigators reported falls in terms of percentages. Lynn (1980) and Morgan et al. (1985) indicated that patients had about a 2% chance of falling at least once during admission to an acute care facility in the United States. Clark (1985) reported that, overall, patients had a 1.7% chance of falling during admission to a large teaching facility in Australia. This figure rose to 3.5% for patients aged 65 and older.

Numerous other investigators reported the number of patient falls which occurred in a specific time period, but failed to indicate the number of patients at risk or the

number of patient days, thus precluding the calculation of fall rates in these facilities.

Injuries Sustained as a Result of Falls

There was general agreement in the literature about the outcome of falls in terms of the injuries sustained. Most studies in acute care facilities reported that 60 to 70% of all falls resulted in no injuries; 20 to 35% resulted in minor injuries, including abrasions, bruises and lacerations; and 5% resulted in serious injuries, including fractures and head injuries (Morse, Tylko, & Dixon, 1987). A small percentage of falls, usually less than 0.5%, resulted in the death of the patient. There were very few attempts to determine how age and gender were correlated with fall-related injuries in acute care facilities.

Morris and Isaacs (1980) reported that 23.3% of falls resulted in soft tissue injuries, and 1.69% resulted in fractures in a geriatric hospital in England. Berry et al. (1981) and Sehested & Severin-Nielsen (1977) reported fracture rates of 3.2% and 4.17% in patients in geriatric hospitals in Canada and Denmark. Falls proved to be fatal in 0.1% of patients who fell in the study carried out by Berry et al. (1981).

Morse, Prowse, et al. (1985) reported that 69.9% of falls produced no injury; 26.5% resulted in bruises, lacerations, and abrasions, and 3.6% resulted in serious

injuries, including fractures, concussion and wound dehiscence. Innes and Turman (1983) reported similar injury rates. Sixty-seven percent of falls in their study produced no injury, 31% resulted in minor injuries, and 2% resulted in fractures. Jarvinen and Jarvinen (1968) reported a much higher incidence of injury and subsequent death in patients who fell out of bed. They reported that 27.6% of patients suffered wounds or concussion and 6.38% sustained a fracture as a result of falling out of bed. Four patients (8.5%) died within three days of the fall. Clark (1985) also reported overall high injury rates, and especially high rates in elderly patients who fell. She reported that 49% of all patients who fell suffered minor or insignificant injuries while 1.2% of these patients suffered fractures of long bones, and 4.8% sustained other major injuries, including concussion and lacerations which required suturing. Fifty-three percent of all patients over the age of 65 who fell suffered injuries and 8% of these injuries were considered consequential.

Situational Variables Surrounding Patient Falls

Investigators have attempted to identify the situational, or environmental, factors surrounding falls in institutionalized populations. These external factors have been emphasized in several studies, no doubt because they are more readily identified and more easily modified than

patient characteristics. Among the situational variables most frequently examined were length of stay, time of falls, location of falls and patient activity, and the use of restraint devices.

Length of stay. Most investigators reported that fall incidents were highest during the first week and after the third week of admission to acute and long term care facilities (Hill, Johnson, & Garrett, 1988; Kulikowski, 1979; Manjam & MacKinnon, 1973; Swartzbeck, 1983; Swartzbeck & Milligan, 1982). Barbieri (1983) reported that 28% of falls occurred within six days of admission to a Veterans Administration Medical Centre. In another study, almost one-third of patients who fell out of bed did so within four days of admission to hospital (Walshe & Rosen, 1979). Morse, Prowse, et al. (1985) reported that 38.3% of all falls occurred during the first week of hospitalization, and that 8.5% occurred on the first day of admission. Manjam and MacKinnon (1973) reported that "some patients fell as soon as they entered the ward" (p. 24).

The high incidence of falls within the first week of hospitalization has been attributed to the patient's unfamiliarity with the environment, the anxiety and tension associated with the patient role, acute illness and a weakened physical condition, and the staff's unfamiliarity with the patient (Catchen, 1983; Coyle, 1979; Swartzbeck, 1983). Investigators have posited that falls after the

third week of hospitalization are related to older age, multiple and chronic illnesses, and attempts on the part of the staff to encourage patient mobility and independence (Swartzbeck & Milligan, 1982).

Time of falls. Investigators have attempted to identify the day of the week, month of the year, and time of the day when patient falls occurred. They believed that if patterns could be identified, staffing could be adjusted and patient falls reduced or eliminated.

Lund and Sheafor (1985) reported that 41% of all falls occurred on Tuesdays and Thursdays and that patients hospitalized during September, October, and November were at highest risk to fall. Morse, Prowse, et al. (1985) found a noticeable increase in falls on Fridays, and reported that falls were most prevalent in November and December. Lynn (1980) reported that summer was a high risk period for all types of incidents. Others reported no variation in falls by day of the week or season of the year (Innes & Turman, 1983; Swartzbeck & Milligan, 1982).

There was even less agreement in the literature as to the time of day when falls were most likely to occur. Patients in acute care facilities were reported to have fallen most often between 0800 and 1200 hours (Morse, Prowse, et al., 1985); between 2200 and 0600 hours (Manjam & MacKinnon, 1973); and between 1500 and 1900 hours and 0300 and 0700 hours (Lund & Sheafor, 1985). Innes and Turman

(1983) reported that the number of falls was almost equal during the day and evening shifts and Morgan et al. (1985) found that falls were evenly distributed throughout the 24 hour period.

Most investigators agreed that falls during the waking hours occurred during periods of increased patient and ward activity, including morning and bedtime care, mealtimes, and change of shift activities. These falls frequently occurred when patients were ambulatory or were transferring to or from chairs, toilets, and wheelchairs. Falls out of bed occurred most often during the evening and night hours (Catchen, 1983; Coyle, 1979; Jarvinen & Jarvinen, 1968; Walshe & Rosen, 1979). Most falls were not witnessed by staff members (Morris & Isaacs, 1980; Morse, Prowse, et al., 1985).

Location of falls and patient activity. The majority of falls occurred within the patient's room in close proximity to the bed or bathroom. Clark (1985) reported that over 52% of all falls occurred in the immediate bed area. Over half of these (52%) were from the bed, and 17.9% were from chairs, wheelchairs, or commodes. Lund and Sheafor (1985) reported that 55% of falls took place at the bedside, and another 34% occurred within the patient's room. Patients were either getting in or out of bed, a chair or wheelchair, walking within the room, or attempting to change

their position or transfer independently at the time of the fall.

A slightly smaller number of patient falls occurred within the bathroom. Morgan et al. (1985) reported that 29% of falls occurred in the bathroom. Many more falls were bathroom related: Patients were either on their way to or from the bathroom when falls occurred. Numerous other investigators in a variety of acute and long term care settings have also suggested an association between elimination needs and patient falls (Ashley, Gryfe, & Amies, 1977; Barbieri, 1983; Garcia, Cruz, Reed, Taylor, Sloan, & Beran, 1988; Innes & Turman, 1983; Sehested & Severin-Nielsen, 1977; Walshe & Rosen, 1979).

The use of restraint devices. Fagin and Vita (1965) reported that 130 of 250 falls out of bed (52%) occurred despite the use of siderails. Siderails have been reported to be in place in anywhere from 10 to 100% of falls out of bed in more recent studies (Catchen, 1983; Clark, 1985; Innes & Turman, 1983; Morse, Prowse, et al., 1985; Walshe & Rosen, 1979). Walshe and Rosen (1979) reported that 13.2% of patients who fell out of bed had a jacket restraint in place, in addition to the siderails, at the time of the fall. Innes and Turman (1983) found that 67% of patients who fell out of bed when siderails were raised also had other restraints in place. They also reported that patients

were physically restrained in 37% of the falls from chairs and 60% of the falls from wheelchairs.

Studies have indicated that nurses use restraints to protect patients from falls and injuries, to maintain treatment regimes, and to control behavior in patients who wander, or who are confused, agitated, or aggressive (Fletcher, 1990; McHutchion & Morse, 1989; Strumpf & Evans, 1988; Yarmesch & Sheafor, 1984). The high incidence of falls in the presence of siderails and other restraint devices has led many investigators to question the effectiveness of physical restraints in preventing falls. Others have suggested that physical restraints not only fail to prevent patient falls, but may contribute to falls or to increased injuries, as patients attempt to climb over siderails or struggle to escape their restraints (Lynn, 1980; Maciorowski et al., 1988; Spellbring et al., 1988).

In summary, patient falls were a recurrent problem in all health care facilities. Investigators generally found that the tendency to fall increased with age, and that a history of falls was a strong predictor of future falls. Patients who fell were often alert and oriented, but were taking a variety of medications, and were more likely to have a diagnosis of cardiovascular, cerebrovascular or neurological disorders, cancer or dementia. Patients with an unsteady gait, poor balance, and decreased mobility had a higher incidence of falls. Approximately 60 to 70% of falls

resulted in no injuries, 20 to 35% resulted in soft tissue injuries, and approximately 5% resulted in serious injuries and even death.

Falls occurred during all hours of the day, days of the week, and months of the year. However, a higher incidence of falls occurred during the first week and after the third week of hospitalization. Most falls occurred in the patient's room in close proximity to the bed, in the bathroom, or while the patient was going to, or returning from, the bathroom. The role of ambulatory devices in contributing to or preventing patient falls was unclear, but falls occurred despite the use of siderails and other restraint devices.

Critique of Institution Based Fall Studies

It was difficult to draw conclusions about patient falls in acute care hospital settings despite the number of studies carried out and the amount and variety of data generated. Studies for the most part relied on the retrospective analysis of incident reports to determine the incidence, patient characteristics, and situational variables surrounding falls. Wan and Shukla (1987) indicated that incidents, such as patient falls, represented standard measures of patient outcomes and that information could be generated from hospital incident reports. The

possibility does exist, however, that not all falls were reported by staff. Furthermore, this method of data collection relies on the accuracy and completeness of documentation. It is possible that incident reports, completed in the past for different purposes, were missing important information which could not be retrieved because considerable periods of time had passed (Morse, Prowse, et al., 1985).

An even more basic problem was that related to the definition of falls. All studies embraced the general concept that a fall involved an unintentional change in the position of the body (Danish Medical Bulletin, 1987). A few investigators provided a comprehensive definition of falls (Morris & Isaacs, 1980; Morse, Tylko, & Dixon, 1987). However, many investigators failed to clarify what events were included in their definition of a fall (Berryman et al., 1989; Clark, 1985; Lund & Sheafor, 1985; Swartzbeck, 1983). Others, like Johnson (1985), provided a definition of falls, but excluded events that were considered falls in other studies. The lack of definition and the multiplicity of different events included in the term "fall" confounded the assessment of the problem and made comparisons between studies extremely difficult (Hadley, Radebaugh, & Suzman, 1985).

Several investigators reported on all patient accidents, not just falls (Catchen, 1983; Jones & Smith,

1989; Lynn, 1980; Tinker, 1979; Weil & Parrish, 1958). This made it difficult to determine fall rates, and patient and situational variables surrounding falls, as opposed to all types of patient accidents. Fall rates were difficult to compare because investigators used different denominators in reporting falls or failed to define the population at risk, thereby precluding the calculation of fall rates (Morse, Tylko, & Dixon, 1985a).

Studies on patient falls were carried out in a wide variety of facilities. Inadequate descriptions of these facilities and the population under study made comparisons between the facilities difficult, and in many cases, inappropriate. The characteristics of patients who fell and the circumstances surrounding falls were largely determined by simple observation of tabulated data. Only a few studies tested the statistical significance of potential fall risk factors for their patient population (Raz & Baretich, 1987).

Most studies developed their profile of the patient who fell by looking solely at patients who had fallen. Only a few studies (Janken et al., 1986; Lund & Sheafor, 1985; Morse, Morse, & Tylko, 1986; Morse, Tylko, & Dixon, 1985a; 1985b; 1987) used a control group to compare patients who fell with those who did not. The lack of comparison groups in the other studies made it impossible to distinguish between characteristics of the hospital population at large and those specific to patients who fell, and to determine

the extent to which variables predicted whether falls would occur (Janken et al., 1986).

In summary, patient fall studies, although extensive in number, have been fraught with weaknesses which have made it difficult to draw comparisons between institutions and arrive at general conclusions about patient falls. Nevertheless, these studies have provided insights into the magnitude of the problem and some understanding of the patient and situational variables surrounding falls. Furthermore, they have emphasized the need to identify patients at risk to fall if attempts to prevent, or reduce, patient falls are to be successful.

Identification of Patients at Risk to Fall

The ultimate goal of all health care facilities is to reduce or prevent patient falls. Numerous investigators have therefore attempted to develop a profile of patients who fall so that this might be used prospectively to identify patients at risk. Strategies or interventions to prevent falls could then be directed toward these high risk individuals.

Numerous studies reported the development of falls risk factor checklists for use in identifying patients at risk to fall. These checklists relied on risk factors reported in the literature or compiled following a study of patient

falls within the institution. Risk factors for each patient were checked off and added up to determine that individual's fall risk. The number of risk factors required to identify the patient as high risk varied with the institution (Fife et al., 1984; Hill et al., 1988; Spellbring et al., 1988).

A few investigators moved beyond simple falls risk factor checklists to the development of scales for use in identifying patients at risk to fall (Berryman et al., 1989; Innes & Turman, 1983; Morse, Morse, & Tylko, 1986; Rainville, 1984). Innes & Turman (1983) identified 13 risk factors in their standard care plan designed to identify patients at high risk to fall. Two of these risk factors, "confused and disoriented," and "patient has fallen previously" automatically scored 15 points each if present. The remaining items were scored on a scale of 0 to 5 points. The patient was considered to be at high risk to fall if the final score added up to 15 or more points. This scale lacked discriminatory power. Almost all patients were identified as being at high risk to fall because of the large number of risk factors included in the scale. Furthermore, the risk factors were not defined and the scoring system was not adequately described. Lastly, the scale was complex and required the use of the assessment sheet and pencil to determine the score (Morse, Morse, & Tylko, 1986).

Rainville (1984) also developed a standard care plan to identify patients at risk to fall. She reduced the number of risk factors to five and simplified the scoring system, but reported that the scale had limited ability to identify patients at risk to fall. Rainville (1984) concluded that the criteria to identify patients at risk to fall would need to be expanded.

Berryman et al. (1989) developed a 10 item scale to identify patients at risk to fall and assigned point values to each item based on the role each played in contributing to falls. They attempted to define each of the fall risk factors and paid special attention to the category concerned with balance and gait. A score of 10 or greater was used to identify patients at risk to fall.

The risk factors included in each of these scales were derived from studies on falls which failed to utilize control groups to determine how patients who fell differed from those who did not. In each case, there was a limited description of the work that went into the development of the instrument, and no information about the selection of the high risk score, or the validity and reliability testing of the instrument.

In contrast, the work by Morse and her colleagues stands out in the field of patient falls research (Morse, 1986; Morse, Black, et. al., 1989; Morse, Morse, & Tylko, 1986; Morse, Prowse, et al., 1985; Morse, Tylko, & Dixon,

1985a; 1985b; 1987). In developing the Morse Fall Scale, they overcame the methodological weaknesses inherent in the other studies. They developed the Morse Fall Scale over a number of years, provided a comprehensive description of the work that went into its development, used control groups and multiple research methods, defined the risk factors and scoring system, and reported reliability and validity data. Most importantly, the Morse Fall Scale proved to be easy and quick to use and score in the clinical area, and had a greater than 80% accuracy in its ability to predict patient falls.

In summary, research efforts in recent years have focused on the development of instruments to identify patients at risk to fall. Unfortunately, these instruments have lacked discriminatory power, were weak methodologically, and had limited application beyond the facility in which they were developed. The Morse Fall Scale, on the other hand, underwent considerable development and testing and appears to offer hope in identifying patients at risk to fall in a variety of acute care facilities.

Summary

A broad body of knowledge exists regarding falls generally, and patient falls in particular. The central

theme throughout the falls-related literature was on the early identification of patients at risk to fall so that measures to prevent falls could be implemented. However, a basic question, namely how well patients at risk to fall are being identified in the clinical area, remains unanswered. This question needs to be addressed so that we might have a better understanding of how to proceed in our efforts to reduce, or prevent, patient falls.

CHAPTER III: CONCEPTUAL FRAMEWORK

The conceptual framework which guided this study was based on the quality assessment paradigm described by Donabedian (1966) and components of the nursing process as described by Roy (1984).

Structure - Process - Outcome Paradigm

Donabedian (1966) identified structure, process, and outcome criteria as approaches to the assessment of health care. This paradigm is probably the nearest thing to a framework that presently exists in the quality assurance literature (Downs, 1980). Structure criteria refer to the relatively stable characteristics and components of the health care system which are assumed to influence the quality of care provided (Demlo, 1983). Nursing quality assurance studies have examined the influence of such structural variables as patient classification systems, nurse characteristics, standards of practice, inservice education, and organization of nursing care at the ward level, on the quality of nursing care (Lang & Clinton, 1983). Investigators have devoted considerable attention to trying to identify the extent to which these same variables have contributed to patient falls.

Process criteria refer to the "activities, interventions, and sequences of events that constitute care giving" (Lang & Clinton, 1983, p. 216). In nursing this includes the collection of data, the definition of the problem, and the planning, implementation and evaluation steps which make up the nursing process. The nursing process embodies all that nurses do in providing care to patients and is universally accepted as the model for nursing practice. The nursing process provides a logical and rationale way for nurses to organize information so that the care they provide is appropriate, efficient, and effective (Leddy & Pepper, 1985).

Outcome criteria refer to the results of care that can be related to the structure and process of care (Lang & Clinton, 1983). Outcome assessments examine the effects of care on patient outcomes (Demlo, 1983). Donabedian (1966) operationalized outcomes to include recovery, restoration of function, and survival. He later identified 11 categories of health outcomes and two categories of satisfaction (Donabedian, 1968). Other researchers expanded the definition of outcomes to include intermediate states (Shapiro, 1967), and diagnostic, therapeutic, and educational outcomes (Williamson, 1971).

"The most important measure of nursing's worth is in patient outcomes for which nurses have primary responsibility" (Majesky, Brester, & Nishio, 1978, p. 366).

Outcome studies in nursing have tended to focus on physical and mental health status, social and physical functioning, health attitudes, knowledge and behavior, utilization of health resources, and the patients' perceptions of the quality of nursing care (Lang & Clinton, 1983). The use of physiological complications, or negative outcomes, as indices of quality have been used almost exclusively by medicine, although Majesky et al. (1978) considered infection, immobility, and fluid balance to be sensitive indicators of the quality of nursing care. Patient falls represent a negative outcome of care in this study.

The Roy Adaptation Model

Roy (1984) utilized a systems model construct as the underpinning of the Roy Adaptation Model for Nursing. Roy views the person as an adaptive system in constant interaction with his/her changing environment. Stimuli from the environment outside the person, and those originating from within the individual, impact upon the person. The person, as an adaptive system, attempts to respond in a manner which will maintain his/her integrity. The person does this through internal processes or adaptive mechanisms. The resultant behavior is manifested in the individual in the physiological, self-concept, role function, and interdependence modes.

The goal of nursing is to promote adaptation in each of the four adaptive modes. The nurse aims to increase the individual's adaptive responses which maintain his/her integrity and decrease the ineffective responses which disrupt the integrity of the individual. The nurse may alter, increase, decrease, remove, or maintain stimuli to promote adaptation. In doing so, the nurse contributes to the person's health, quality of life, and dying with dignity (Andrews & Roy, 1986).

The activities carried out by nursing to support persons in their adaptation are outlined as a six step nursing process. Assessment of behaviors, assessment of stimuli, nursing diagnosis, goal setting, intervention, and evaluation comprise the steps of this nursing process.

The assessment of behaviors, often referred to as first level assessment, involves the collection of data regarding behaviors in each of the four adaptive modes - the physiological, self-concept, role function, and interdependence modes. Behaviors are responses to environmental (internal and external) changes that can be observed, measured, or subjectively reported. From this data, nurses make a tentative judgement as to whether behaviors are adaptive or ineffective. The assessment of stimuli, or second level assessment, involves the identification of factors which influence the behaviors of concern. These factors are referred to as stimuli. Growth

and development (age and physical abilities), internal factors (disease and medications), external factors (surgical procedures), psychosocial factors (culture, knowledge, beliefs, and perceptions), and past adaptation patterns are general categories of stimuli which have a lifelong and permeating effect on behavior (Andrews & Roy, 1986; Roy, 1984). These stimuli are frequently cited as risk factors which contribute to patient falls.

The third step of the Roy Adaptation Nursing Process involves the formulation of a nursing diagnosis. A nursing diagnosis represents the nurse's interpretation of the assessment data. Nursing diagnoses "describe actual or potential health problems which nurses, by virtue of their education and experience, are capable and licensed to treat" (Gordon, 1976, p. 1299). Roy (1984) also stressed the need to identify both adaptive and ineffective behaviors so that the former could be maintained or enhanced, and the latter changed to adaptive behaviors. Nursing diagnosis is an integral part of the nursing process and clearly delineates the domain of nursing practice.

The fourth step of the Roy Adaptation Nursing Process involves the identification of goals or objectives. Goal setting involves the establishment of statements of the behavioral outcomes of nursing care for the person (Leddy & Pepper, 1985; Roy, 1984). The nurse must then determine how he/she can assist the person to attain these goals. Thus,

the fifth step of the nursing process is intervention, and involves the selection and implementation of nursing actions which have the greatest likelihood of achieving the desired results. Intervention involves the management of stimuli (Andrews & Roy, 1986).

The plan of nursing care includes the nursing diagnosis, the goals derived from the nursing diagnosis, and the nursing actions selected to achieve the goals. The nursing care plan gives direction, guidance, and meaning to nursing care, provides a means of communicating, synchronizing, and organizing activities of the nursing team, and provides for continuity of care (Griffith & Christensen, 1982).

The final step of the nursing process is evaluation. The nurse assesses the person's behavior to determine the effectiveness of the nursing actions in attaining the desired goal (Andrews & Roy, 1986). Evaluation is continuous and ongoing throughout the nursing process.

Summary

Patient falls threaten the quality of care provided in acute care institutions. Nurses are in the best position to prevent falls because of their constant contact with patients throughout hospitalization. The structure-process-outcome paradigm proposed by Donabedian (1966) provides a

framework for evaluating the quality of nursing care. The Roy Adaptation Model provides nurses with a comprehensive nursing process for assessing and identifying patients at risk to fall. Together, they provide an appropriate framework to examine nurses' knowledge, assessment skills, and ability to identify individuals at risk to fall.

CHAPTER IV: METHODOLOGY

Introduction

The patient falls literature did not include any studies which examined how knowledgeable nurses are about the causes and prevention of falls. Despite general agreement in the literature that identification of patients at risk to fall was the first, crucial step in any falls prevention program, there have been no attempts to determine how well these patients are being identified in the clinical setting. This study examined these issues. This chapter addresses the research questions, the assumptions and definitions which guided the study, the design, the research setting, the selection and recruitment of subjects, ethical considerations, measurement tools, and finally, the method of data collection and analysis.

Research Questions

The research questions which guided this investigation were as follows:

1. Which falls risk factors (behaviors and stimuli) did nurses consider when assessing patients?
2. Which risk factors led nurses to formulate a falls-related nursing diagnosis?

3. To what extent did the Morse Fall Scale identify patients at risk to fall?
4. What was the potential of each method (nurses' assessments and the Morse Fall Scale) in identifying patients at risk to fall?
5. What was the incidence of outcomes, in terms of patient falls, among study subjects?

Assumptions of the Study

The assumptions underlying this study included the following:

1. The prevention of patient falls is largely dependent on the accurate identification of patients at risk to fall.
2. The assessment of patients at risk to fall is largely the responsibility of nursing.
3. Patient falls are one index of the quality of nursing care.
4. Patient falls represent negative patient outcomes.
5. Nurses assess many patient behaviors and stimuli believed to contribute to patient falls but do not necessarily use this assessment data to identify patients at high risk to fall.

Definition of Terms

Theoretical Definitions

Elderly Patients: Individuals who are 65 years of age or older and are being treated as inpatients on general medical and surgical units in an acute care community hospital.

Behavior: A person's responses to internal and external environmental changes that can be observed, measured, or subjectively reported (Roy, 1984).

Stimuli: Anything which precipitates, contributes to, or affects behavior (Roy, 1984).

Fall Risk: The presence of one or more patient or situational variables (behaviors or stimuli) that increased the likelihood that the patient would fall during hospitalization.

Patient Outcome: The results of care - some measurable aspect of health status.

Patient Fall: Any untoward event whereby a patient came to be resting unintentionally on the floor. This included patients who fell from a bed, chair, or wheelchair; those who fell while walking, due to fainting or slipping; patients found lying on the floor unable to account for themselves; and patients eased to the floor by a nurse or bystander (Morris & Isaacs, 1980; Morse, Tylko, & Dixon,

1987). This definition was consistent with the policy within the hospital in which the study was conducted.

Operational Definitions

Fall Risk: Was assessed by: (a) reviewing nurses' documentation on the nursing care plan and in the patient record to determine the presence of a falls-related nursing diagnosis; and (b) using the Morse Fall Scale to identify patients at risk of falling. A score of 16 was the value used by Morse, Morse, and Tylko (1986) to separate patients at high risk to fall from those at low risk and was the value used in this study.

Falls-Related Nursing Diagnosis: The presence of an entry on the nursing care plan and/or patient record which stated "potential for injury" or an entry which stated the behaviors and stimuli which made the patient vulnerable to falls (Gordon, 1987; Lederer, Marculescu, Gallagher, & Mills, 1986; Roy, 1984).

Patient Outcome: A patient fall reported on a hospital incident report. The unit of exposure was defined as patient days in hospital. This unit of exposure permitted comparisons with other studies and was most appropriate in a study where patients would not necessarily be followed throughout their entire period of hospitalization.

Notation: All the behaviors and stimuli documented by nurses on the nursing care plan and/or patient record during each 24 hour period, i.e. 0001 to 2400 hours.

Design of the Study

A descriptive design was used for this study. In view of the limited research regarding nurses' assessments and ability to identify patients at risk to fall, the investigator attempted to describe the fall risk variables which nurses included in their assessments, and to determine those which nurses perceived as contributing to patient falls. Specifically, the investigator utilized a concurrent review of patient records and nursing care plans to record and code the fall-related behaviors and stimuli documented by nurses on study subjects. At the same time, the investigator used a fall scale instrument to identify study subjects who were at risk to fall. The patient was the primary source of this data. Lastly, hospital incident reports were utilized to determine the patient and situational variables surrounding patient falls, the outcome of interest in this study.

These observations were carried out daily from the time patients were admitted to one of the study units until the time of discharge from hospital, or for a maximum of 30 days. Thirty days was selected at the outset of the study

as the point at which patients became long stay patients. Qualitative and quantitative research methods were used to analyze the data.

Research Setting

The study was conducted in a 321 bed acute care community hospital in the city of Winnipeg. Data collection took place on two 40 bed surgical units, two 40 bed medical units, and in the 12 bed Intensive Care Unit. The medical and surgical units were similar in design, each having the same number and configuration of private, semi-private, and four bed rooms, service rooms, and bathrooms. Each unit had a conference room and a central nursing station. The two surgical units had four unit stations in addition to the central nursing station. Each unit had a head nurse, registered nurses (RN's), licensed practical nurses (LPN's), and auxiliary staff.

Bed utilization on both medical units exceeded 99% occupancy throughout the study. As a result, there were few direct admissions to the medical units. Patients were admitted to medical beds via the Emergency Department, either directly, or following stays in the Observation Unit or Intensive Care Unit. Although designated as acute care units, both medical units had a high proportion of patients awaiting transfer to long term care facilities throughout

the study period. Modified team nursing was practiced on both medical units. The staffing pattern and numbers were similar on both units, although one unit had a slightly higher ratio of registered nurses to licensed practical nurses due to the presence of six telemetry beds.

One surgical unit was designated as general surgery while the other was designated as orthopedic and general surgery. Unit assignment was the system of nursing care delivery practiced on both surgical units. In this type of care delivery system, a registered nurse assumed responsibility for 10 patients on his/her self-contained unit. Units were designated as high level or low level care and patients were transferred from one unit to another as their level of nursing care changed. The registered nurse was assisted in the care of the 10 patients by other professional or auxiliary staff depending on the level of care required by patients in that unit. The general surgical unit had higher staffing numbers and a greater ratio of RN's to LPN's than the orthopedic/general surgical unit.

The 12 bed Intensive Care Unit (ICU) was a multidisciplinary unit which admitted any adult patient requiring the technological supports, monitoring, and higher nurse:patient ratio available in that area. Nurses were assigned total care of one or two patients in ICU. Three medical and five surgical patients spent part of their

admission in the Intensive Care Unit. However, only the surgical patients who had been enrolled in the study pre-operatively on the ward, were followed post-operatively in the Intensive Care Unit. The three medical patients were admitted to the Intensive Care Unit directly from the Emergency Department and were not approached to join the study until their transfer out of ICU to a medical bed.

The four medical/surgical units and the Intensive Care Unit had each been practicing according to the Roy Adaptation Model for periods of one to three years when this study commenced. Nurses in each area had received an extensive orientation to the Roy Adaptation Model and the use of nursing diagnosis prior to the introduction of theory-based practice.

Gaining Access to the Research Setting

Access to patients and patient records was initiated by means of a letter to the Assistant Executive Director, Nursing at the community hospital selected for the study. The letter outlined the purpose of the study and requested permission from the hospital to approach patients, and to review the nursing care plans, patient records, and fall-related hospital incident reports of study subjects (Appendix A). A copy of the research proposal and the facility's "Request for Research/Survey/Study" form was included in this submission.

Selection and Recruitment of Subjects

Selection Criteria

General criteria for admission of subjects into the study included:

1. Patients 65 years of age or older.
2. Admitted or transferred to one of the four medical or surgical units included in the study.
3. Ability to speak and/or understand English.
4. Ability to give informed consent or have a family member available and willing to give consent on the patient's behalf.

Although age is not synonymous with falling, elderly patients were selected as study subjects because of their greater propensity to fall.

Recruitment of Subjects

Upon approval from the various review committees to proceed with the study, the investigator met with the Nursing Director and Head Nurses from each of the four nursing units involved in the study. The study was explained to these individuals and permission sought to carry out the study on their respective units (Appendix B). The commitment of the Head Nurses to approach potential study subjects was also obtained at this time.

A computer list of all patients admitted, transferred, or discharged from hospital was generated by the Patient Registration Department each day. The investigator used this list to select the names of patients 65 years of age or older who were admitted to one of the four nursing units included in the study. The investigator then visited these units and discussed these eligible patients with the Head Nurse to determine the patient's physical and mental status and suitability for inclusion in the study. The Head Nurse then approached patients considered to be suitable subjects, explained the study to them according to a pre-established protocol, and ascertained their willingness to have the investigator visit them to provide further details of the study. This process, whereby patient contact was initiated by a third party, ensured that the investigator, with a vested interest in the study, did not exercise coercion in order to obtain subjects for the study.

The Head Nurse notified the investigator of patients who were willing to see her to discuss the study further. The investigator visited these patients, explained the study, and invited them to participate in the study (Appendix C). Patients who agreed to participate in the study were asked to sign a consent form (Appendix D).

Patients who were confused, or those who were unable to read or understand an explanation of the study, were not approached directly regarding their involvement in the

study. The investigator contacted the relatives of these patients, explained the study to them, and requested their permission to include the patient in the study. The investigator was prepared to visit relatives in their home or to meet them at the hospital to answer questions and to have them complete the necessary consent form (Appendix E).

A total of 12 patients or relatives, who initially agreed to meet with the investigator to discuss the study, refused to participate in the study once it had been explained to them. Patients who refused to participate in the study indicated that they were "too old for this," "too anxious," "did not want to be bothered," or "did not have the education to answer the questions." Three patients indicated that they wished to discuss the study with their son or daughter before agreeing to participate, but had failed to do so on follow-up visits. Relatives cited the patient's confusion and acute illness as reasons for not including the patient in the study. The reasons given by patients and relatives for not participating in the study were consistent with those reported by Duffy, Wyble, Wilson, and Miles (1989).

In total 40 subjects, 20 surgical and 20 medical patients, aged 65 or over, were recruited into the study. Entry into the study was staggered in order to facilitate daily data collection.

Ethical Considerations

This research project was approved by the Ethical Review Committee, School of Nursing, University of Manitoba, and by the Research Review Committee at the participating hospital, prior to any formal recruitment of subjects (Appendices F and G).

Each subject, or relative in the case of patients who were confused or did not understand English, received a thorough explanation of the study, the expectations of study participants, and the investigator's name and contact number. Subjects and relatives were informed that participation in the study was voluntary, that they could withdraw from the study at any time or refuse to answer questions, and that their participation or refusal to participate in the study would not affect the care received. Signed, informed consent was obtained from all subjects, or their relatives, prior to the commencement of data collection (Appendices D and E). Subjects' attending physicians were notified in writing of the patients' involvement in the study (Appendix H).

To ensure confidentiality, all data was coded using numbers, and this data and any lists, matching names with code numbers, were kept in a locked filing cabinet, to which only the investigator had access. The subjects were informed that coded data might be shared with the

investigator's thesis committee for purposes of data analysis only, and that all data would be destroyed one year following the completion of the study. Subjects were also informed that individual study participants would not be identified when publishing or presenting the results of the study.

The Nursing Director and Head Nurses on the nursing units included in the study received a thorough explanation of the purpose and significance of the study prior to the commencement of data collection. Head Nurses were asked to inform their staff that a study on patient falls was being carried out, but not to divulge details of the study in case this sensitized nurses to the problem of patient falls and caused them to change their normal documentation practices. The hospital and Head Nurses were informed that individual nurses and nursing units would not be identified in the compilation of study results.

Measurement Tools

Instruments used for data collection consisted of a Patient Information Form, a Falls Risk Factor Checklist, the Morse Fall Scale, and a Patient and Situational Variables Surrounding Falls Form. These instruments and the forms used to record the data are described in the following sections.

Patient Information Form

A Patient Information Form was used to collect information related to the subject's age, gender, admission and discharge dates, surgical procedures and dates performed, and the length of hospitalization (Appendix I). This information permitted the investigator to describe the characteristics of subjects included in the study.

Falls Risk Factor Checklist

"Objective measures of what nurses know about falls, risk factors, and the identification of patients who are at risk for falls have not been developed" (Maciorowski et al., 1988, p. 19). It was therefore necessary to develop an instrument which could be used to answer the research questions posed in this study.

The initial step in this process was the development of a Falls Risk Factor Checklist. This list included 21 patient and situational variables found to be associated with patient falls throughout the literature. Each risk factor was numbered to facilitate data collection. This Falls Risk Factor Checklist was used by the investigator to code the behaviors and stimuli documented by nurses throughout the data collection period (Appendix J).

The documentation of behaviors and stimuli known to contribute to falls did not necessarily indicate that nurses

considered these patients to be at risk to fall. Therefore, fall risk was established by the presence of a falls-related nursing diagnosis. This nursing diagnosis was acceptable either as a statement which indicated there was a "potential for injury" or as an entry which indicated the behaviors and stimuli which made the patient vulnerable to falls. The presence of a falls-related nursing diagnosis both identified the patient as being at risk to fall and communicated this information to other members of the health team.

A Data Collection Flow Sheet was developed to facilitate the daily assessments of behaviors and stimuli and nursing diagnoses recorded by nurses throughout the data collection period (Appendix K). Each flow sheet could accommodate 10 days of nursing documentation.

The Morse Fall Scale

The investigator assessed patients' fall risk utilizing the Morse Fall Scale throughout the study, in addition to coding the behaviors and stimuli recorded by nurses. The Morse Fall Scale is a six item scale used to prospectively identify patients at risk to fall. It was selected for use in this study because of the extensive work that has gone into its development, its clarity in terms of definitions and scoring, and the fact that it can be used and scored easily in the clinical area.

The Morse Fall Scale was developed in a large urban hospital in western Canada. Morse, Prowse, et al. (1985) initially carried out a retrospective analysis of all patient falls which had occurred in that centre over a one year period. The findings were consistent with other published studies and led Morse and her colleagues to conclude that the fall-prone patient and the events surrounding falls conformed to a pattern.

Morse, Tylko, and Dixon (1985a) then compared 100 patients who had fallen with 100 randomly selected patients who had not, on a host of patient and situational variables frequently reported to be associated with patient falls. Stepwise discriminate analysis revealed that six variables were significant in correctly classifying 80.5% of all cases. This figure increased to 82.9% of cases correctly classified when computer modelling techniques were used to simulate a normalized hospital population (Morse, 1986).

The six variables found to be significant in predicting falls included a history of falling, the presence of a secondary diagnosis, use of ambulatory aids, intravenous therapy, gait, and mental status. Weights were calculated for each of these variables. The six variables and their resulting values formed the Morse Fall Scale (Appendix L). The variables were clearly defined by Morse and her colleagues (Appendix M).

Morse, Morse, and Tylko (1986) indicated that each institution could establish its own score to identify patients at risk to fall, based on the resources available for fall prevention within that facility. A score of 16 was utilized by Morse, Morse, and Tylko (1986) to identify patients at risk to fall and was the value selected for use in this study.

The Morse Fall Scale has undergone some reliability and validity testing. Inter-rater reliability estimations for a five item scale ranged from r = .82 for gait to r = 1.0 for a history of falling and intravenous administration, with an overall reliability of r = .96. Mental status was excluded from the testing because of difficulties in obtaining consent from the legal guardians of confused patients (Morse, Morse, & Tylko, 1986).

Validity was established by randomly splitting the cases and repeating the scale construction procedures. Discriminant analysis then correctly classified 79.41% of cases, a difference that was not significant. Morse, Morse, and Tylko (1986) also examined cases that were incorrectly analyzed by the discriminant analysis, traced these cases in the original data, and examined the circumstances of the falls as a second validation procedure. This analysis revealed that 78% of all falls could be anticipated based on the six scale items. More recently, Morse, Black, et al. (1989) conducted a prospective study of patient falls on

acute, long-term, and rehabilitation units in two institutions. A total of 252 weeks of data were collected on 16 patient care units and 2689 patients were assessed during this period. This study provided further evidence of the clinical validity of the Morse Fall Scale. Permission to use the Morse Fall Scale was granted by Morse (Appendix N).

The Data Collection Flow Sheet already described was used throughout the data collection period to document the scores and variables that patient subjects obtained on the Morse Fall Scale.

Patient and Situational Variables Surrounding Falls Form

The Patient and Situational Variables Surrounding Falls Form was developed to summarize information from hospital incident reports, the Data Collection Flow Sheet, and the nursing care plans and patient records of any patients who fell while participating in the study (Appendix O). This information allowed the investigator to describe the patient and situational variables surrounding the falls suffered by patients in this study.

Method of Data Collection

The investigator visited patients who expressed an interest in participating in the study in their hospital

room. During this visit the investigator provided the patient with an explanation of the study and the expectations regarding subjects' participation in the study (Appendix C). A consent form was reviewed with patients who agreed to participate in the study before obtaining their signature, thus ensuring informed consent (Appendix D).

Once consent was obtained, the investigator assessed the patient's fall risk, utilizing the Morse Fall Scale. Five of the six variables on the Morse Fall Scale were determined through patient assessment and/or interview. The sixth variable was determined through review of the patient record.

Patients were questioned about previous falls and asked to describe the event. This allowed the investigator to determine the nature and timing of the fall. This variable was scored as positive if a previous fall was recorded during the present hospital admission, or if there was an immediate history of a physiological fall, caused by a seizure or an impaired gait, prior to admission.

All patients, except those on bedrest, were asked to walk a short distance so that the investigator could assess their gait and need for ambulatory devices. The presence of an intravenous or heparin lock was also noted at this time.

Mental status was measured by checking patients' self-assessment of ability. Patients were asked if they were allowed up or if they required assistance to get up or go to

the bathroom. Patients' responses were later compared to the activity orders on the nursing care plan. If the patients' responses were consistent with the orders on the nursing care plan, they were considered to be oriented to their own abilities and mental status was rated as normal. If the patients' responses were not consistent with these orders, or if patients' assessments were unrealistic, patients were considered to overestimate their abilities or to forget their limitations.

The investigator reviewed the patient record at the time of this initial visit. Medical documentation was reviewed to determine the presence of a secondary diagnosis, the sixth variable on the Morse Fall Scale. Data related to the patient's age, gender, diagnosis, and admission date were recorded on the Patient Information Form. Surgical procedures and the dates performed, and the discharge date, were documented on the Patient Information Form as they occurred throughout the patient's hospitalization. The length of hospitalization was determined following the patient's discharge from hospital.

The Falls Risk Factor Checklist (Appendix J) was then used to review nursing documentation on the patient record and nursing care plan. This allowed the investigator to determine which falls risk factors (behaviors and stimuli) nurses considered when assessing patients, and which of

these risk factors led nurses to formulate a falls-related nursing diagnosis.

The data collection process described above was carried out by the investigator within one to three hours of the time most surgical patients were admitted to the ward. One surgical patient was admitted two days pre-operatively and was not seen by the investigator until approximately 20 hours following his admission.

This was not the case with the medical patients. All medical patients were admitted via the Emergency Department. Ten patients spent several hours to several days in the Observation Unit or Intensive Care Unit, prior to being transferred to a medical unit. Patients were not approached to participate in the study while they remained in these areas because of their acute illness, the lack of privacy in these multi-bed units, and the uncertain nature of their course in hospital. As a result, most medical patients did not enter the study until several days following their presentation in the Emergency Department. Nursing documentation during this period was retrieved by means of a chart review following the patient's entry into the study. However, Morse Fall Scores and documentation on the nursing care plan were not assessed prior to the patient's entry into the study.

The investigator utilized the Morse Fall Scale and the Falls Risk Factor Checklist on a daily basis throughout the

patients' hospitalization, to a maximum of 30 days for each patient. The Morse Fall Scale was used to determine the patients' fall risk. The Falls Risk Factor Checklist was used to determine which behaviors and stimuli nurses documented when carrying out patient assessments and to ascertain which of these risk factors led nurses to formulate falls-related nursing diagnoses.

Patients and nursing documentation were assessed once in each 24 hour period. It quickly became apparent that the investigator needed to organize the times at which she assessed patients' gait and use of ambulatory aids with the nurses caring for the patients. This was accomplished by leaving instructions on the nursing care plan to call the investigator prior to getting the patient out of bed. This approach permitted the investigator to assess the patients at times when they would normally be mobilizing. It reduced patient fatigue and ensured a minimum of disruption in hospital routines and nursing procedures. Data from the patient assessment and review of nursing documentation was transcribed daily onto the Data Collection Flow Sheet.

The Patient and Situational Variables Surrounding Falls Form was completed whenever a fall was recorded in a patient subject. The patient's diagnosis, surgical procedure, the date, time and location of the fall, the description of the fall incident, the nurse's assessment of the patient's orientation and level of mobility at the time of the fall,

and safety devices in use at the time of the fall were extracted from the hospital incident report (Appendix P). Information regarding the injuries sustained and the treatment required was also completed with the use of the incident report. Raz and Baretich (1987) indicated that incident reports represented, in practice, the most complete source of documentation regarding adverse occurrences in hospitals. The patient's age, gender, and admission date, as well as documentation of fall-related behaviors and stimuli before and after the incident, were taken from the patient record and nursing care plans of patients who fell. Morse Fall Scores of patients who fell were retrieved from the Data Collection Flow Sheet.

Data Collection commenced on July 17, 1989 and was completed on January 25, 1990.

Validity and Reliability

The Falls Risk Factor Checklist was submitted to three nurses with knowledge of the patient falls literature and experience in caring for elderly patients to establish its content validity. Content validity relates to the degree to which the items in an instrument measure the domain intended, as determined by a panel of experts (Wilson, 1985). The nurse experts suggested that the variables confusion and disorientation be combined into one variable, and that the variable agitation/restlessness be added to the

list of falls risk factors. They also indicated that alterations in bowel elimination should be considered as a falls risk factor.

These changes were incorporated. The revised Falls Risk Factor Checklist and the Data Collection Flow Sheet were pre-tested in the clinical area by the investigator and one other nurse. Each used the checklist to code the behaviors and stimuli recorded by nurses in the patient records and on the nursing care plans of four patients over a period of five days (a total of 20 patient days). Findings were compared. Falls risk factors were more clearly defined or expanded where inconsistencies in coding had occurred.

The investigator developed competence in using the Morse Fall Scale by repeatedly viewing the videotape produced by Morse and her colleagues. Finally, reliability of the data collection tools was promoted by having the investigator carry out virtually all the assessments during the course of the study.

Data Analysis

Several methods of data analysis were used to translate the data collected into an interpretable and meaningful form. The specific techniques used to analyze patient information, nursing documentation, Morse Fall Scale

variables and scores, and patient falls are described in the following section.

Patient Information Data Analysis

Descriptive statistics were used to summarize the characteristics of the medical and surgical samples. Measures of central tendency (mean) and measures of variance (standard deviation) were calculated in order to better describe the age and length of stay variables, and to permit comparisons between the medical and surgical sample.

Nurses' Documentation of Falls-Related Behaviors and Stimuli, Nursing Diagnosis, and Morse Fall Scale Analysis

Qualitative and quantitative analysis, namely the use of content analysis and descriptive statistics, were used to describe the falls-related behaviors and stimuli which nurses considered when assessing patients, to determine which of these behaviors and stimuli led nurses to formulate a falls-related nursing diagnosis, and to describe the use of the Morse Fall Scale. These approaches were appropriate for a study at the level of exploration and description. Little was known about nursing documentation related to falls, and the study was intended to gain insight into the process whereby nurses assessed and identified patients at risk to fall.

The investigator's first task was to describe the nature and frequency of nursing entries that corresponded to a classification scheme taken from the literature. The second task was to describe the use of the Morse Fall Scale as an instrument to identify patients at risk to fall. What had appeared to be a relatively simple task at the outset of the study was complicated by the large sample size (40 patients), the length of hospital stay (508 hospital days), and the amount of documentation generated by nurses during the data collection period. The investigator, therefore, adopted a series of reductionistic and constructionistic activities which allowed her to manage the data and derive meaningful analysis from it. The techniques used paralleled the process described by Knafl and Webster (1988).

Data management activities. The following activities, carried out sequentially, reduced the data to a manageable form:

1. Patient records and nursing care plans of subjects were reviewed each day and a transcription made of the falls-related behaviors and stimuli documented by nurses. The investigator used the Falls Risk Factor Checklist to carry out this review. Behaviors and stimuli, which appeared related to, but did not clearly fit the risk factor categories previously established, were identified.

2. Subjects' fall risk was determined each day, using the Morse Fall Scale. The score, and the variables contributing to that score, were identified.
3. The behaviors and stimuli identified in #1 above, were coded with the number assigned to that falls risk factor.
4. The above data was transcribed onto the Data Collection Flow Sheet (Appendix K).
5. All the data described above was transcribed onto a larger flow sheet. This flow sheet permitted the data for each patient's entire period of hospitalization to be documented on a single form. The need for such a form became obvious at the data analysis stage, when the investigator was trying to determine trends and to examine relationships between the behaviors and stimuli documented by nurses and the variables and scores obtained on the Morse Fall Scale.
6. Finally, grids were constructed to reflect the data for the entire surgical and medical patient samples. Falls risk factors were placed on the vertical axis and patient subjects on the horizontal axis in the first grid. The frequency with which nurses documented falls-related behaviors on each subject was entered on the grid.

This grid made it "possible to review all data on a given subcategory across subjects and to review all data from a given subject across subcategories" (Knafl & Webster, 1988, p. 201). The second grid was developed to reflect the Morse Fall Scores by subject and by day of admission.

Data analysis activities. A series of constructionistic activities were then employed, whereby the data was rebuilt into a thematically relevant whole and presented as study results. The steps in this rebuilding included the following:

1. Each falls risk factor subcategory was reviewed across subjects to determine the frequency with which nurses documented behaviors and stimuli related to that falls risk factor. Each falls risk factor was also presented as a percentage of all falls-related behaviors and stimuli documented by nurses.
2. The nature of the entries related to each falls risk factor was described by referring back to the original transcript of the falls-related behaviors and stimuli documented by nurses.
3. Morse Fall Scale variables were reviewed by referring back to the coded data to determine which variables were present in the sample.

4. Morse Fall Scores were examined to determine the number of patient subjects who were at risk to fall during the study and the number of patient days on which they were at risk.

All nursing diagnoses recorded by nurses throughout patients' hospitalization were noted during review of the patient records and nursing care plans. It was anticipated at the outset of the study that many subjects would have a falls-related nursing diagnosis, and that correlational procedures would be used to determine how nurses' assessments of patients' fall risk compared to assessments made utilizing the Morse Fall Scale. Only a small number of nursing diagnoses met the criteria for falls-related nursing diagnoses. Therefore, descriptive statistics were used to describe the factors which led nurses to formulate falls-related nursing diagnoses.

Patient Falls Analysis

Patient falls are one index of the quality of nursing care and represented the outcome of interest in this study. The unit of analysis used to describe the fall rate in this study was the number of falls per patient day. This unit of exposure permitted comparisons with other studies and was most appropriate in a study where patients might not be followed throughout their entire period of hospitalization.

Descriptive statistics were used to describe the characteristics of patients who fell, the situational variables surrounding the falls, and the injuries sustained as a result of the falls. The Morse Fall Scores of patients who fell and the variables which contributed to these scores were included in the analysis.

Summary

The methods used in conducting a descriptive study to identify patients at risk to fall have been discussed in this chapter. The research questions, assumptions, and definitions which guided the study have been outlined. The research setting, sample, ethical considerations, measurement tools, methods of data collection, and data analysis procedures have been described.

The results of the data collection will be presented in the next two chapters.

CHAPTER V: RESULTS - SURGICAL PATIENTS

Introduction

This descriptive study was designed to identify the falls-related behaviors and stimuli which nurses considered when assessing patients; to determine which of these behaviors and stimuli led nurses to formulate a falls-related nursing diagnosis; to determine the extent to which the Morse Fall Scale was useful in identifying patients at risk to fall; and to determine the potential of each method as a means of identifying patients at risk to fall in an acute care hospital setting. Lastly, the study examined outcomes, in terms of patient falls, among study subjects. The results are presented in the next two chapters. Surgical and medical patient samples were analyzed separately because of the different points at which these patients entered the study. Where appropriate, comparisons have been drawn between the two samples.

Characteristics of the Sample

Twenty surgical patients (n = 20) were included in the study. The sample was comprised of 12 males (65%) and 7 females (35%). Subjects ranged in age from 67 to 91 years, with a mean age of 76.7 years (S.D. = 6.37). Male patients

were, on average, 4.15 years older than female patients (78.15 years as compared to 74 years).

All patients were admitted for scheduled surgical procedures. Six patients, all males, had surgery related to the genitourinary system. Five patients underwent abdominal surgery; six, orthopedic procedures; and two, cardiovascular surgery. One patient had surgery on her neck.

Surgical patients spent a total of 214 patient days in hospital. The length of stay ranged from 3 to 29 days, with a mean length of stay of 10.7 days (S.D. = 6.82). Five surgical patients (25%) were admitted to the Intensive Care Unit post-operatively for periods ranging from one to seven days. In total, surgical patients spent 18 days in hospital in the Intensive Care Unit. One patient expired three days post-operatively due to respiratory complications.

Nursing Documentation of Falls-Related Behaviors and Stimuli

Nursing documentation of falls-related behaviors and stimuli, and the use of this data to identify patients at risk to fall was the central issue in this study. The Falls Risk Factor Checklist was used to review nursing documentation on the patient records and nursing care plans to determine the nature and frequency of such entries. The results are presented under the following broad headings:

age, history of previous falls, medical diagnosis, physical status, mental status, medication use and substance abuse, and situational variables associated with falls.

Age

Patients in this study were all over the age of 65 years, the age at which individuals are believed to become more prone to falls. The chronological age of all 20 surgical patients was documented by the nurse at the time of admission. The patients' developmental stage, either mature adult or later maturity, was included for 13 patients. Age was imprinted on each page of the patient record and recorded on the nursing care plan on all patients at the time of admission. Nurses documented that age was one of the stimuli responsible for a patient's altered oxygenation. There were no further nursing notations regarding patients' age beyond those made at the time of admission.

History of Previous Falls

None of the surgical patients had a history of falling prior to admission to hospital, according to nursing documentation in the patient record and on the nursing care plan. One patient fell during his first evening in hospital. The circumstances surrounding the fall were documented on the patient record, and a note indicating that the patient had "slid out of his wheelchair the evening pre-

operatively" was added to the nursing care plan two days following his fall. This latter entry remained on the nursing care plan up until the time of the patient's discharge from hospital.

Medical Diagnosis

Patients with cardiovascular, cerebrovascular and neurological disorders, cancer and dementia, and those with multiple diagnoses were reported to be at increased risk to fall throughout the literature. These disease entities, when present as primary or secondary diagnoses, or the presence of three or more other diagnoses, were considered falls risk factors in this study.

Nurses documented the reason for the patients' present admission as well as previous and concurrent medical conditions/hospitalizations at the time of admission. The analysis of this variable was complicated by this, as nurses did not always indicate whether the disease was controlled, or, if not controlled, the extent to which it influenced the patients' present health status.

Nurses documented a total of 18 notations regarding medical diagnosis. Nurses reported that cardiovascular disease or cancer was the reason for admission and scheduled surgery in seven patients. Another four patients were noted to have a history of hypertension or cardiovascular disease, including recent myocardial infarction. Two of these latter

patients had three or more medical diagnoses documented at the time of admission. Nurses cited one patient's previous stroke and residual right-sided weakness as the stimuli causing his altered mobility. This notation remained on the patient's nursing care plan throughout his admission.

Physical Status

Eight of 21 falls risk factors were considered to represent a facet of physical status. Mobility and gait problems, alterations in elimination, sensory deficits, communication deficits and a language barrier, dizziness and balance problems, generalized weakness, and post-operative condition are discussed in this section. Ambulatory assistive devices were included under physical status because of their close relationship to, and ability to influence, mobility and gait behaviors.

Mobility and gait problems. Behaviors most frequently cited in the literature as contributing to falls included a weak or unsteady gait, an impaired gait characterized by a shuffle or Parkinsonian gait, decreased mobility or muscle weakness in the lower extremities (including paresis and paralysis), joint difficulties, and amputations.

Nurses assessed the usual activity patterns, posture and gait, and joint mobility of all patients at the time of admission to the ward. Eight patients were reported to have ineffective behaviors related to mobility and gait. These

behaviors included limited joint mobility, pain and stiffness in one hip (3 patients); limited joint mobility, pain and stiffness in the knees (4 patients); and limited movement in the right arm and leg due to a previous cerebrovascular accident (CVA). Nurses documented that one patient walked with a limp and that another "dragged his right foot when walking." Other entries were less specific, and raised the question of whether nurses had actually observed the patients walking or had recorded the patients' perceptions of their mobility and gait. Based on the initial assessment data, nurses identified four patients as having decreased or altered mobility.

Nurses documented ineffective mobility and gait behaviors in eight patients on 17 occasions following the admission assessment. Patients were reported to be "unsteady or wobbly" on their feet, to be "non-weight bearing" or "partial weight bearing," and to "transfer poorly."

Use of ambulatory assistive devices. The use of canes, walkers, wheelchairs, crutches, furniture, and prosthetic devices were considered falls risk factors in this study.

Nurses questioned 19 of the 20 surgical patients regarding their use of ambulatory assistive devices at the time of admission to hospital. Eight patients were reported to use a cane or walker to get about. A ninth patient was reported to be walking with a cane on his first evening in

hospital, although the use of a cane had not been recorded at the time of admission. Documentation revealed that eight patients continued to use ambulatory assistive devices in the post-operative period. Nursing entries indicated that patients progressed from being up with canes or walkers and two assistants, to being up with standby assistance and, finally, to being independent with ambulatory aids.

Nurses documented a total of 76 notations regarding the use of ambulatory aids during patients' hospitalization. Seventeen entries were recorded only on the nursing care plan. Documentation within the patient record indicated that patients were up with assistance, but did not specify what this assistance entailed. The remaining entries in the patient record ranged from those which stated only that patients were up with their walkers, canes, or crutches, to those which indicated the distance patients walked and their tolerance of the activity. Approximately half of the entries indicated only that patients were managing well with their ambulatory aids. None of the entries indicated that patients were using ambulatory aids incorrectly, or were having difficulty using the device.

Alterations in elimination. Incontinence, frequency, urgency, nocturia, and the presence of a urinary catheter or ostomy were the alterations in elimination identified as falls risk factors in the literature. The nurse experts who reviewed the Falls Risk Factor Checklist suggested that

alterations in bowel elimination, including diarrhea, the presence of an ostomy, and the administration of enemas, also predisposed patients to falls.

Nurses assessed the bowel and bladder function of all patients at the time of admission to hospital. Eight surgical patients were reported to have adaptive behaviors related to elimination. The other 12 patients were reported to have ineffective elimination behaviors including frequency, hematuria, urgency, nocturia, and occasional incontinence. Nurses identified three patients as having actual or potential problems with urinary elimination based on this assessment data.

Nurses continued to document adaptive and ineffective behaviors related to elimination throughout the patients' hospitalization. Many of the entries indicated only that patients were up to the bathroom independently or with the assistance of a nurse. Nurses documented a total of 100 notations of ineffective bowel and bladder behaviors in surgical patients during the study. These notations included the administration of enemas pre and post-operatively, the presence and care of urinary catheters, drainage systems and ostomies, and incidents of urgency, dribbling and incontinence.

Sensory deficits. Visual and auditory impairments and decreased sensation in the lower extremities were considered falls risk factors in this study. The use of corrective

lenses was considered an ineffective behavior (Roy, 1984). Morse, Tylko, and Dixon (1987) and Spellbring et al. (1988) reported an increased number of falls among patients who wore corrective lenses.

Nurses assessed auditory and visual behaviors of all patients at the time of admission. Notations on the patient record indicated that all patients wore glasses "constantly" or for "reading." Nurses documented that two patients felt their hearing had "decreased from what it used to be." Six patients were reported to have severe sensory deficits, including cataracts and glaucoma, which interfered with vision, and hearing loss, which required the use of one or two hearing aids. Nurses cited a profound hearing loss as one of the stimuli responsible for a patient's knowledge deficit.

Notations regarding hearing loss appeared on two patients' nursing care plans. In one case this notation remained on the nursing care plan throughout the patient's stay in hospital. A second patient was transferred to another nursing unit and the notation regarding hearing loss removed from the nursing care plan at that time. However, nurses documented that the patient was "very hard of hearing" and "finds that restrictive" on two occasions in the patient record.

Two patients had surgery under spinal anaesthesia. Nurses documented the lack of sensation in the patients'

lower extremities and the maintenance of bedrest in the post-operative period. Another patient developed blurred vision in the post-operative period and the nurse recorded that the patient "felt this was causing her dizziness and nausea." Nurses documented a total of 39 notations indicative of visual, auditory, or sensory deficits during the study.

Communication deficits or language barrier. An inability to communicate effectively was reported to be associated with falls in studies by Campbell (1988), Edelstein (1983), Innes (1985), Innes and Turman (1983), Lynn (1980), and Spellbring et al. (1988).

Nurses documented a total of five notations related to communication deficits during patients' hospitalization. One patient was reported to have "difficulty forming sentences" at the time of admission and the nurse documented that this was due to a previous stroke. A second patient was reported to be "frustrated as he can't talk with his endotrachial tube in" and to be "intubated and unable to speak." This patient became very confused and disoriented two days later and nurses documented that his "speech is garbled at times" and that they were unable to understand the patient.

Dizziness and balance problems. Nurses reported that seven patients experienced problems with dizziness or balance during the post-operative period. A total of 10

notations were documented in these seven patients. Nurses used the terms "dizzy" or "dizziness" on six occasions to describe the behaviors experienced by patients. "Light-headed" and "faint" were other terms used to describe these behaviors. One patient was reported to be "able to move fairly well although slightly unbalanced." This notation raised some questions as to whether the patient actually had a problem with balance or if the problem was related to an unsteady gait.

Generalized weakness. Most investigators agreed that generalized weakness contributed to patient falls but used a variety of terms to describe this state. The terms tired, fatigue, lethargy, exhaustion, and weakness were accepted as behaviors which indicated a state of generalized weakness in this study. The terms sleepy and drowsy were used extensively by nurses to describe patients' behavior but were not considered adequate, when used alone, to constitute a state of generalized weakness.

One patient was reported to tire easily due to anemia at the time of admission. Nine other patients experienced generalized weakness in their post-operative period. Nurses documented that patients were tired (14 notations), weak (3 notations), weak and tired (3 notations), weak and lethargic (1 notation), and exhausted (1 notation). Nurses reported that another patient needed to be lifted back to bed after being up in the chair. Although this notation did not

include any of the terms listed above, the patient behaviors were considered to represent a state of generalized weakness. Nurses documented a total of 23 notations of generalized weakness in these 10 patients.

Post-operative condition. Fife et al. (1984) and Innes and Turman (1983) reported that patients were at risk to fall during the immediate post-operative period. All 20 patients in this sample were admitted for some surgical procedure. Nurses routinely documented the scheduled surgery as the reason for admission, and recorded all pre-operative teaching and preparation of the patient for the Operating Room. At the time of admission, nurses identified four patients as being at risk to develop problems with elimination, bleeding, or activity in the post-operative period.

Nursing documentation in the post-operative period was complete in terms of patient assessment, but made only passing reference to the patients' post-operative condition. Five patient records indicated only that patients had returned to the ward. Fifteen records indicated the patients' return to the ward from the Operating Room/Recovery Room, and indicated the surgery performed, and the type of anaesthetic administered.

Other physical status behaviors. Nurses used a variety of terms, not included on the Falls Risk Factor Checklist, to describe other physical behaviors in surgical patients.

Nurses documented repeatedly that patients were "drowsy" or "sleepy" in the post-operative period. These behaviors were not considered to indicate a state of generalized weakness, as already mentioned. Other terms used to describe physical behaviors included "groggy, sedated, shaky, and tremulous." Three patients were reported to be "stiff" or "stiff and tense" when mobilizing early in the post-operative period.

Mental Status

Confusion/disorientation, impaired memory/judgment, and depression were widely reported as falls risk factors in the literature. The expert nurses who reviewed the Falls Risk Factor Checklist suggested that agitation and restlessness were also common in patients who fell.

Confusion/disorientation. For purposes of this study, the variable confusion/disorientation included general and periodic confusion, disorientation to person, place and time, and delusional and hallucinatory behaviors. A Clinical Flow Sheet, with a section entitled Mental Status, was in use on the two surgical units. This form permitted nurses to document, by means of a checkmark, that patients were lucid, confused, or intermittently confused. However, all nursing entries on the patient records and nursing care plans were reviewed to determine the presence of behaviors indicative of confusion/disorientation.

Nursing documentation indicated that nine surgical patients were confused/disoriented at some time during their hospitalization. One patient was reported to be disoriented at the time of admission, and remained confused or intermittently confused throughout his hospital stay. Another patient was reported to be alert and oriented at the time of admission, but became confused the evening prior to surgery, and remained confused until his death three days after surgery. Six patients became confused/disoriented post-operatively for periods ranging from 2 hours to 13 days. One patient was reported to be disoriented by the family. Nurses documented this observation but did not record any other confused/disoriented behaviors in this patient. Nurses documented a total of 38 notations of confused/disoriented behaviors. Patients were in the Intensive Care Unit on 17 (44.74%) of these occasions.

Fifteen notations of confusion/disorientation were documented only on the Clinical Flow Sheet. The remaining entries were recorded in the narrative notes, often in addition to the entry on the Clinical Flow Sheet. Nursing documentation ranged from entries which indicated only that patients "remained confused" or were "pleasantly confused at times" to very detailed descriptions of the patients' behaviors. One entry indicated that the patient "knows his name but answers inappropriately to time and place - states adamantly that it is 1948." Another notation indicated that

the patient's confusion was increased and that the patient was "paranoid (thinks little boys are stealing from her)," and that she was "very untrusting and suspicious of nursing staff."

Agitation/restlessness. Nurses reported that seven surgical patients demonstrated agitated/restless behaviors on a total of 18 days. One patient was reported to be restless on the evening of admission. The other patients developed agitation/restlessness in the post-operative period. Three patients in the Intensive Care Unit accounted for 11 of the 18 notations of agitated/restless behaviors. Fifteen notations of agitation/restlessness occurred in patients who were concomitantly experiencing confused/disoriented and hallucinatory behaviors. Two patients were reported to be restless two and four days prior to the onset of confusion/disorientation. Another patient experienced a single episode of restlessness four days following a period of confusion.

Documentation again ranged from brief notations indicating that patients were "very agitated" or "restless at times" to detailed descriptions of the patients' behavior. Nurses did not always separate confusion/disorientation from agitation/restlessness in their documentation, thus several entries reported that patients were "increasingly agitated and confused."

Impaired memory and judgment. This variable included the inability to remember or follow directions. Eight patients were reported to have ineffective behaviors related to memory and judgment on 12 occasions during the study. Notations made on the day of admission indicated that five patients were forgetful or had problems remembering recent events. It was unclear whether this information was based on the nurses' assessments, or on patients' reported perceptions of their memory and judgment. There was no indication that four of the patients had any problems with memory or judgment during admission. Nurses documented that the fifth patient could not remember that he was for surgery, and cited memory loss as one of the stimuli causing his knowledge deficit.

Nurses documented behaviors indicative of impaired memory and judgment in three patients, on six occasions, during the post-operative period. One patient was reported to be "somewhat forgetful" on one occasion. Nurses documented that the other patients had two and three episodes of forgetfulness and inability to follow directions. Five incidents of impaired memory/judgment occurred in conjunction with confused and disoriented behaviors.

Depression. The variable depression included the use of the terms depressed/depression or a description of behaviors that indicated a state of depression. Nurses

documented a single episode of depression in three patients during the study. One patient was reported "to appear depressed" at the time of admission, and the nurse documented "probably due to impending diagnosis of cancer." Another patient was reported to "seem deep in thought, almost withdrawn, perhaps somewhat depressed." The third patient was reported to be "eating poorly and appear depressed."

Other mental status behaviors. Nurses used a variety of other terms to describe patients' mental status behaviors. Nurses documented that four patients were "anxious, apprehensive, nervous, or worried" about their hospitalization and impending surgery. Nine patients were reported to be "mad, angry, upset, frustrated, inappropriate, belligerent, combative, argumentative, uncooperative, or irritable" during their stay in hospital. These terms were not widely cited as falls risk factors in the literature, but were used frequently by nurses to describe the patients in this study. These behaviors were always documented in conjunction with confused/disoriented behaviors, and to a lesser extent when behaviors indicative of agitation/restlessness and impaired memory and judgment were present.

Medication Use and Substance Abuse

The policy in effect within the facility in which this study was conducted required that all medications given, omitted, or refused be documented on a form entitled the Medication Record or Medication Profile. The routine recording of medications on these forms was not included in this review. Medications recorded in narrative fashion on the patient record were included.

Nurses questioned all patients about their use of medications and medication allergies at the time of admission. Seventeen patients were reported to be taking at least one medication on a regular basis. Two patients were taking three or more medications. Surgical patients received a large number and variety of medications while in hospital. Nurses documented a total of 167 notations of medication administration in narrative form in the patient record. Analgesics were documented most frequently, followed by sedatives, laxatives/purgatives, anticoagulants, antiemetics, and cardiotonic agents. Nurses routinely documented the effect of analgesics, laxatives/purgatives, antiemetics, and sedatives. On one occasion nurses documented that an analgesic may have caused the patient's confusion and hallucinatory behavior, and on another occasion, that a sedative was being withheld because of the patient's drowsiness.

One of the questions to be completed at the time of admission addressed the patient's use of alcohol, including the type and amount consumed, the period of time over which this had been the practice, and the date of the patient's last drink. The assessment form was blank in nine patients, suggesting that nurses either failed to ask the question, or failed to complete the assessment form. Nurses reported that two patients responded "no" to the question and four patients indicated that they drank "socially, on special occasions, or very little." Five records included a complete assessment of the patients' use of alcohol. There was no indication that these behaviors were perceived by nurses as being ineffective. There were no other notations regarding the use of alcohol or other non-prescribed substances during the patients' hospitalization.

Situational Variables Associated with Falls

The use of siderails and other restraint devices, and the presence of an unfamiliar or hazardous environment were reported in the literature as contributing to patient falls.

Use of siderails. Siderails were used extensively in surgical patients. Nurses documented the use of siderails on 185 occasions, or over 86% of the days on which surgical patients were in hospital. Documentation was usually in the form of a checkmark on the Clinical Flow Sheet, under a section entitled Safety. This form of documentation

permitted the investigator to determine only the use or non-use of siderails, the frequency with which they were used, and the pattern of usage.

Siderails were not used in pre-operative patients who were alert and oriented. They were used throughout the post-operative period until patients had regained total independence in mobility. Typically, siderails were used at all times in the early post-operative period. The use of siderails was reduced to the night hours only, and then discontinued altogether one or two days prior to discharge.

Nurses documented the use of siderails in the narrative notes on 13 occasions, usually in addition to the entries on the Clinical Flow Sheet. Eleven notations indicated that siderails were raised following the administration of the pre-operative medication. The other two entries indicated that siderails were up and that the patient was "agitated and rattling his siderails."

Use of other restraint devices. Nurses documented the use of jackets, hand/wrist restraints, and chemical substances in five patients for periods ranging from two to five days, for a total of 18 notations. Restraints were used while patients were in the Intensive Care Unit and on the surgical wards. Although there was provision to document the use of jacket and hand/wrist restraints on the Clinical Flow Sheet alongside siderails, nurses routinely

documented the use of these restraints in their narrative notes.

Jacket restraints were used in five surgical patients in the post-operative period. Nursing documentation indicated that jacket restraints were applied to "prevent injury" and as "a precaution" in patients who were attempting to climb out of bed. Hand and wrist restraints were used in three of these patients, in combination with a jacket restraint, to prevent the patients from pulling on their urinary catheters, intravenous or central lines. Chemical substances were administered to two patients, on a total of eight days, when other restraint devices were also in use.

Nurses documented behaviors of confusion and disorientation in all five patients prior to the initiation of any restraint device. Four patients were also reported to be agitated and restless. Both patients who received chemical substances had undergone major vascular surgery and developed extreme confusion, agitation, and hallucinatory behaviors in the post-operative period. Both patients were seen by Psychiatry and diagnosed as post-operative psychosis. Jacket and hand/wrist restraints were discontinued when confusion/disorientation and agitation/ restlessness abated and reapplied when mental status deteriorated. Nurses documented the continued use of jacket

restraints in two confused patients up until the time of their discharge and demise.

Unfamiliar and hazardous environment. An unfamiliar environment, due to recent admission or transfer, and unsafe environmental conditions, including spills on floors, unsafe footwear, unlocked wheels on beds and wheelchairs, lack of safety rails, and the incorrect use of equipment, were cited in the literature as factors which contributed to falls in an already vulnerable patient population.

All surgical patients received a thorough orientation to their immediate environment at the time of admission to hospital. Following this, nurses documented all patient transfers to and from the Operating Room/Recovery Room, Intensive Care Unit, and all interroom transfers on the surgical ward. Patient orientation to each of these new areas was not always included in the nursing documentation. One patient was reported to be "wandering the hallway" and to be "unaware of his surroundings." These behaviors were used to describe the patient's confusion and restlessness and were therefore interpreted as mental status changes. There were no other notations to indicate that patients were unfamiliar with their environment.

Nurses reported that one patient slipped onto the floor when he tried to turn around in his wheelchair. Another notation indicated that the patient felt unsafe mobilizing with crutches. There were no other notations which

suggested the presence of hazards within the hospital environment.

Summary

Nurses documented a total of 780 ineffective behaviors related to the falls risk factors during the 214 days surgical patients spent in hospital, or an average of 3.64 falls risk factors per patient day. The number of notations for each falls risk factor, and that number as a percentage of all the falls risk factor notations, are summarized in Table 1.

The use of siderails and the administration of medications accounted for over 45% of all the falls-related behaviors and stimuli documented by nurses. Behaviors which indicated alterations in elimination accounted for almost 13%, and the use of ambulatory aids almost 10%, of all nursing notations. Age, medical diagnosis, the use of restraint devices, and behaviors indicating that patients had problems with sensory functions, mobility or gait, or were confused/disoriented, agitated/restless, or weak each accounted for between 2 and 5% of all the falls risk factors documented by nurses. Problems with dizziness or balance, memory or judgment, or entries regarding the post-operative condition accounted for between 1 and 2% of all notations. Indications that patients had fallen previously, were unable to communicate effectively, were depressed, or encountered

Table 1

Falls Risk Factor Notations Documented in Surgical Patients (n = 20)

Falls Risk Factor	No. of Notations	% of Total Falls Risk Notations
Age	20	2.56
History of Falls	6	0.77
Medical Diagnosis	18	2.31
Mobility/Gait	25	3.21
Use of Ambulatory Aids	76	9.74
Alteration in Elimination	100	12.82
Sensory Deficits	39	5.0
Communication/Language	5	0.64
Dizziness/Balance	10	1.28
Generalized Weakness	23	2.95
Post-operative Condition	15	1.92
Confusion/Disorientation	38	4.87
Agitation/Restlessness	18	2.31
Impaired Memory/Judgment	12	1.54
Depression	3	0.38
Medication Use	167	21.41
Substance Abuse	0	0.0
Use of Siderails	185	23.72
Other Restraints	18	2.31
Unfamiliar Hazardous } Environment	0 2	0.0 0.26
TOTAL	780	100.00

hazards within the hospital environment, each accounted for less than 1% of all nursing notations. Nurses did not document any notations which indicated that patients used substances inappropriately or were unfamiliar with their environment.

The total number of notations and the number of different falls risk factors documented by nurses during the study indicated that nurses assessed falls-related behaviors and stimuli on a frequent and ongoing basis. This documentation, in itself, did not indicate that nurses considered these patients at risk to fall. The following section, therefore, examines how nurses used their assessment data to identify patients at risk to fall.

Identifying Patients at Risk to Fall

Identification of patients at risk to fall is the first, crucial step in any program to reduce or prevent patient falls. Nursing diagnosis is one way of doing this. The use of fall scale instruments is another. These two approaches are discussed in the following section. Finally, comparisons between the two approaches are presented.

Use of Nursing Diagnosis to Identify Patients at Risk to Fall

Nursing diagnosis is the final step of the assessment phase of the nursing process. Nursing diagnosis identifies actual or potential health problems and communicates this information to other members of the health team.

Nurses formulated one or more nursing diagnoses on 18 of the 20 patients during their hospitalization. A total of 29 nursing diagnoses were documented on the patient records and/or nursing care plans. Most of these nursing diagnoses were formulated at the time of admission by the nurse completing the admission note and nursing assessment. These nursing diagnoses identified actual or potential problems related to anxiety and apprehension (11 patients); altered elimination due to the disease process or scheduled surgery (3 patients); a knowledge deficit (3 patients); and the risk of hemorrhage following surgery (2 patients). Four nursing diagnoses cited fatigue, pain, activity intolerance, or altered oxygenation as problems during patients' hospitalization.

Six nursing diagnoses appeared to meet the criteria for a falls-related nursing diagnosis on initial examination. Five of these were formulated at the time of admission and cited decreased or altered mobility/activity as the ineffective behavior, and pain, an existing disease process, or the impending surgical procedure as the stimuli causing

these behaviors. A sixth falls-related nursing diagnosis, stating that there was a "potential for self injury," was added to the nursing care plan two days following the patient's admission.

Two of these nursing diagnoses appeared on one patient who fell early in his hospitalization. The initial nursing diagnosis, formulated at the time of admission and prior to the fall, indicated that the patient had an "alteration in mobility related to right-sided weakness from a CVA in 1986." The goal stated that the patient would not fall, and the nursing actions indicated that the patient required assistance in transferring to and from the wheelchair. This nursing diagnosis, the goals, and nursing actions were communicated to other members of the health team via the nursing care plan. A second nursing diagnosis was added to this patient's nursing care plan following his fall, and indicated that there was a "potential for self injury." An additional note indicated that this patient was "at risk to fall." No additional goals or nursing actions were added to the nursing care plan at this time.

Nurses clearly identified the above patient as being at risk to fall during his hospitalization. The other four nursing diagnoses, which appeared to be falls-related, lacked clarity in the nursing diagnosis statements, were not supported by goals and nursing actions, and were not communicated to other members of the health team via the

nursing care plan. Nurses may have identified behaviors which made these patients vulnerable to falls, but given only the information documented on the patient record and nursing care plan, this was impossible to determine.

Use of the Morse Fall Scale to Identify Patients at Risk to Fall

The investigator used the Morse Fall Scale on 226 days to determine surgical patients' fall risk. A total of 393 Morse Fall Scale variables were recorded during these 226 days. These variables, the number of patients exhibiting each variable, the total days on which each variable was present, and each variable as a percentage of all Morse Fall Scale variables, are presented in Table 2.

Three patients reported a history of falling due to an impaired gait or decreased sensation in the lower extremities, in the week immediately prior to admission to hospital. This variable, once present, added 25 points to the patients' Morse Fall Score throughout hospitalization. One patient fell while in hospital. This fall did not increase his Morse Fall Score as he had a history of falling prior to admission.

Six patients had a secondary diagnosis recorded on their record during hospitalization. Three patients were admitted with a secondary diagnosis. Two patients developed post-operative complications and another patient was

Table 2

Morse Fall Scale Variables Present in Surgical Patients (n = 20)

Variable	No. of Patients Exhibiting Variable	Total Days Variable Present	% of Total Morse Fall Scale Variables
History of Falling	3	29	7.38
Secondary Diagnosis	6	75	19.08
Ambulatory Aid	7	68	17.30
Intravenous Therapy/Heparin Lock	18	77	19.59
Gait	18	125	31.81
Mental Status	8	19	4.83

diagnosed as having an aortic aneurysm during hospitalization. The presence of a secondary diagnosis added 15 points to patients' Morse Fall Scores.

The use of canes, walkers, and crutches added 15 points to the Morse Fall Score; the use of furniture, 30 points. Six patients were scheduled for orthopedic surgery and were

dependent on canes, walkers or crutches for mobilization both pre and post-operatively. A seventh patient used a cane to get about at admission, but developed complications and expired shortly after surgery, without regaining his ambulatory function.

Eighteen patients received intravenous therapy or intravenous medications during the post-operative period. The presence of an intravenous or heparin lock added 20 points to the Morse Fall Score.

Morse, Morse, and Tylko (1986) identified three levels of scoring for the variable gait. A normal gait or patients confined to bed or a wheelchair scored zero points. A weak gait scored 10 points and an impaired gait, 20 points. Eighteen patients had a weak or impaired gait during hospitalization. Ten patients walked with short, shuffling steps and required varying degrees of support from the nurse in the immediate post-operative period. Six orthopedic patients had an impaired gait throughout hospitalization because of their total dependence on canes, walkers, or crutches. Two patients had grossly impaired gaits when mobilizing or transferring from the bed to a wheelchair. Gait accounted for the largest percentage (31.81%) of Morse Fall Scale variables observed in patients during the study.

Eight patients demonstrated an abnormal mental status during the study. At these times they were unaware of their

activity orders or forgot their limitations. An abnormal mental status added 15 points to their Morse Fall Scores.

The presence of these variables determined patients' Morse Fall Scores throughout hospitalization. A complete list of Morse Fall Scores, by subject and by day of admission, is included in Appendix Q.

Examination of the Morse Fall Scores revealed that ten patients had a score of zero, and one a score of 15, at the time of admission. The remaining nine patients had Morse Fall Scores ranging from 25 to 90 at admission. Two patients' Morse Fall Scores remained zero throughout hospitalization. Both underwent minor surgical procedures and had short hospital stays. Neither patient was at risk to fall during his stay in hospital. The Morse Fall Scores of the remaining 18 patients varied throughout their hospitalization. All were at risk to fall at some point, when 16 was the Morse Fall Score used to establish fall risk. The number of days on which patients were at risk to fall ranged from 1 to 29 days ($\bar{x}$ = 9.0; S.D. = 7.55). In total, surgical patients were at risk to fall on 162 of the 226 days (71.68%) they were assessed using the Morse Fall Scale.

Twelve of the 18 patients whose scores varied during hospitalization were discharged with the same Morse Fall Score as they had at the time of admission, indicating that they had regained their pre-operative status prior to

discharge. Five patients were discharged with Morse Fall Scores 10 to 15 points higher than on admission, the result of a secondary diagnosis made during hospitalization (3 patients), or a deterioration in gait in the post-operative period (2 patients). No patient was discharged from hospital with a lower Morse Fall Score than that present on admission. One patient expired in hospital. His Morse Fall Score on the days immediately preceding his death were lower than at the time of admission due to this unresponsiveness and confinement to bed.

Comparing the Two Approaches

Fall risk was operationalized to include the documentation of a falls-related nursing diagnosis on the patient record or nursing care plan, or a score of 16 or more on the Morse Fall Scale at the outset of this study. Nurses identified only one surgical patient as being at risk to fall. Therefore, any comparison between nursing diagnosis and the Morse Fall Scale as a means of identifying patients at risk to fall was limited to this patient.

Nurses documented ineffective behaviors related to 16 of the 21 falls risk factors in this patient, for a total of 64 notations, throughout his stay in hospital. This was an average of 9.14 notations per patient day ($\bar{x}$ = 3.94; S.D. = 2.03). However, only altered mobility due to right-sided weakness (8 notations), previous CVA (secondary

diagnosis) (8 notations), and a history of falling (6 notations) were identified as factors which made this patient vulnerable to falls and self injury.

This patient was at high risk to fall on 8 days, when assessed using the Morse Fall Scale. His scores ranged from 60 to 80 during admission, due to a history of falling (8 days), a secondary diagnosis (8 days), intravenous therapy (3 days), an impaired gait (7 days), and an abnormal mental status (1 day). His mean Morse Fall Score during admission was 66.88 ($\bar{x}$ = 27.46; S.D. = 21.55 for surgical sample). Only one surgical patient had a higher mean Morse Fall Score during the study.

This patient did in fact slip out of his wheelchair during his first evening in hospital. Seventeen other surgical patients were at risk to fall on a total of 154 days when the Morse Fall Scale and a score of 16 were used to establish fall risk. None of these patients fell during the study.

Summary

Nurses formulated a number of nursing diagnoses on surgical patients during the study. Six of these appeared to meet the criteria for falls-related nursing diagnoses but lacked clarity, goals, and nursing actions. Nurses formulated two nursing diagnoses which clearly identified one patient as being at risk to fall. Nurses cited a

history of falling, mobility/gait problems, and a pre-existing medical condition as the behaviors and stimuli which made this patient vulnerable to fall.

Eighteen surgical patients were at risk to fall on a total of 162 days when the Morse Fall Scale and a score of 16 were used to establish fall risk. The Morse Fall Scale was sensitive to subtle changes in the patient's condition (gait, mental status) and as a result, scores varied greatly throughout hospitalization. A weak or impaired gait was the most frequently observed variable in the surgical sample.

One patient fell during the study. Both the use of nursing diagnosis and the Morse Fall Scale had identified this patient as being at risk to fall.

Outcomes - Patient Falls

One patient fall was recorded during the 214 days surgical patients were in hospital. If projected to a large surgical patient population, the fall rate, based on this one incident, would be 4.67 falls per 1,000 patient days.

A 91 year old male patient, admitted for genitourinary surgery, fell within five hours of admission to hospital. Nurses had documented ineffective behaviors related to age, mobility/gait, vision, mental status (disorientation, forgetfulness), communication, elimination, medication use, the use of ambulatory aids, and the presence of a pre-

existing medical diagnosis in this patient at the time of admission. They had identified the patient as being at risk to fall, citing altered mobility/gait and a pre-existing medical diagnosis as the behaviors and stimuli which made him vulnerable to fall. The patient's Morse Fall Score at the time of admission was 60, based on a history of falling, the presence of a secondary diagnosis, and an impaired gait. This score placed the patient at high risk to fall.

The patient fell at 1810 hours on a Monday evening. The fall occurred in the dayroom and was unwitnessed by staff, other patients, or visitors. The patient reported that he slipped onto the floor when he attempted to turn around in his wheelchair. The nurse completing the incident report indicated that the patient was oriented, required assistance to mobilize, and was unrestrained at the time of the fall. The patient sustained a small scrape to his upper back as a result of the fall. Observation was the only treatment indicated.

Summary

One surgical patient slipped from his wheelchair during the study. The fall occurred during the evening hours and was unwitnessed by staff. The patient was oriented and unrestrained but required assistance to mobilize at the time of the fall. The patient sustained only minor injuries. Nurses had identified this patient as being at risk to fall

by means of a nursing diagnosis. The investigator had also identified the patient as being at risk to fall, using the Morse Fall Scale.

CHAPTER VI: RESULTS - MEDICAL PATIENTS

Introduction

Twenty medical patients were also included in the study. These patients entered the study at a later point in their illness and hospitalization than the surgical patients. As a result, some nursing documentation and Morse Fall Scores were not available for the patients' entire period of hospitalization. Because of the different point at which medical patients entered the study, the sample was analyzed separately. The same format has been used to present the results. Comparisons between the two samples have been made, where appropriate.

Characteristics of the Sample

The sample was comprised of 9 males (45%) and 11 females (55%). Subjects ranged in age from 67 to 88 years, with a mean age of 77.45 years (S.D. = 5.65). Male and female medical patients had almost identical mean ages: 77.33 for males as compared to 77.55 for females. Medical patients were, on average, less than a year older than surgical patients.

All medical patients presented in the Emergency Department. Seven patients (35%) were admitted to a medical

bed following assessment in the Emergency Department. Nine patients (45%) were detained in the Observation Unit for periods ranging from several hours up to three days before transfer to an inpatient bed. Three patients (15%) were admitted to the Intensive Care Unit for a total of eight days before transfer to a medical bed. One patient (5%) was initially admitted to an off service bed because medical beds were unavailable. She was included in the study because she was clearly a medical patient and it was understood that she would be transferred to a medical ward as soon as a bed became available. This transfer took place within 72 hours.

Medical patients were not approached to enter the study while they were in the Emergency Department, Observation Unit, or Intensive Care Unit because of their acute illness, the uncertain nature of their course in hospital, and the lack of privacy in these areas. Therefore, medical patients did not enter the study until one to five days following their presentation in the Emergency Department.

Seven patients (2 males and 5 females) had primary diagnoses related to the cardiovascular system. Five patients (2 males and 3 females) were admitted with respiratory problems. Five patients (4 males and 1 female) had a primary diagnosis of transient ischemic attack or cerebrovascular accident at the time of admission. The female patient was later found to have brain metastases.

Two other female patients had diagnoses of cancer and epistaxis. One male patient had acute renal failure, pneumonia, and alcoholic neuropathy listed as the admission diagnoses.

Medical patients remained in hospital for periods ranging from 2 to 30 days. Two patients remained in hospital beyond 30 days but were no longer included in the study beyond this point. Medical patients spent a total of 294 patient days in hospital. The mean length of stay was 14.7 days (S.D. = 8.87), four days longer than that of surgical patients. One patient succumbed to multisystem failure 18 days following admission to hospital.

Nursing Documentation of Falls-Related Behaviors and Stimuli

Although medical patients did not enter the study until one to five days following their admission to hospital, the investigator was able to review documentation on the patient record retrospectively to determine which falls-related behaviors and stimuli nurses recorded in the days preceding the patients' joining the study. However, data recorded on the nursing care plan may have been lost to the investigator, since information is added, altered, and erased from this form as the patients' condition and the plan of care change. The analysis includes all nursing

documentation on the patient record for patients entire period of hospitalization and notations on the nursing care plan from the point at which patients entered the study. The format used to present the results is the same as that used to discuss the surgical sample.

Age

Nurses documented patients' chronological age in 19 of the 20 medical patients at the time of completing the nursing assessment form. Documentation included the patients' developmental stage, that of a mature adult, in 13 cases. The incorrect developmental stage was recorded on two patient records. Age was imprinted on each page of the patient record and recorded on the nursing care plan as routine information. Nurses indicated that age was one of the stimuli causing a patient's impaired physical mobility. This notation remained on the nursing care plan throughout the patient's hospitalization. Nurses documented a total of 27 age notations while patients were in hospital.

History of Previous Falls

Nurses documented a history of falling in five patients on a total of 31 days. Notations in the Emergency Department or on admission to the ward indicated that four patients had fallen prior to admission. Two falls were related to the presenting complaint. The other two falls

had occurred a few days to a week prior to admission and both patients had extensive bruising and/or sutures as a result of the injuries suffered in these falls. The history of falling was noted on one patient's nursing care plan, but removed from the nursing care plan when the patient was transferred to another nursing unit.

Two patients fell repeatedly while in hospital. All falls were documented on the patient record and on the hospital incident report at the time they occurred. A notation regarding the history of falling was placed on one patient's nursing care plan and updated as subsequent falls occurred throughout his hospitalization.

Medical Diagnosis

Twelve patients were admitted with primary diagnoses related to cardiovascular or cerebrovascular disease, or cancer. Nurses documented this diagnosis, or behaviors consistent with this diagnosis, in all 12 patients. Nurses reported that nine of these patients had a history of cardiovascular or cerebrovascular disease, including hypertension, myocardial infarction, transient ischemic attacks, or strokes. Six patients with primary diagnoses related to other systems were also reported to have a history of cardiac disease, hypertension or strokes. These notations did not usually indicate the duration of the

disease or the extent to which it influenced the patients' present diagnosis and health status.

Nurses cited current or past medical diagnoses as the stimuli causing altered neurological function, activity intolerance, and impaired or altered mobility in five patients. These notations were transcribed onto nursing care plans and accounted for 100 notations related to medical diagnosis during patients' hospitalization.

Physical Status

Mobility and gait problems. Nurses documented 108 notations of ineffective mobility and gait behaviors in 11 patients during the study. Numerous other entries indicated that patients had a paralysis or weakness of one side. However, these entries were not made in relation to mobility or gait and, therefore, were not included in the analysis.

Nursing documentation ranged from a single entry on two records which indicated that patients were "unsteady on their feet" to almost daily and very detailed notations of patients' mobility and gait behaviors. One patient was reported to have a left-sided weakness and to "have trouble bringing her left foot up and around." Another patient was reported to have "some movement in his right leg" and to be able to weight bear during transfer, but to have "difficulty directing his leg into position." Nurses documented on two occasions that two patients were too unsteady to be walking

by themselves, and that they were encouraged to ask for assistance.

Four notations, indicating that patients had ineffective behaviors related to mobility and gait, were recorded on the nursing care plans throughout the patients' hospitalization. These notations accounted for almost half (48.14%) of the mobility/gait notations documented during the study.

Use of ambulatory assistive devices. Nurses documented the use of ambulatory assistive devices in six patients on a total of 59 days of the study. One patient's need for a prosthetic shoe, and another patient's use of the furniture to move about, were each documented on one occasion by nurses. The use of a wheelchair was recorded on three occasions.

Four patients accounted for the other 54 notations of ambulatory aid use. Only 28 notations appeared in the patient record. These were sketchy for the most part, indicating only that patients were "ambulating well with walkers" or were "up in the room with a cane." Five notations indicated that patients needed reminders about the correct use of the ambulatory device. The remaining entries were documented only on the nursing care plan. Documentation in the patient record indicated that these patients were up with assistance, but did not specify what this assistance entailed.

Alterations in elimination. Fifteen medical patients were reported to have ineffective behaviors related to elimination. Nurses documented that seven patients experienced diarrhea due to medications or previous radiotherapy treatments, dysuria, frequency, and/or nocturia on the nursing assessment form. There were no further notations to indicate that these behaviors were problematic during the patients' stay in hospital. The eight remaining patients were reported to have episodes of urinary and bowel incontinence, diarrhea, and dysuria during hospitalization. Other notations related to the care and maintenance of indwelling and condom catheters and the administration of enemas. Nurses documented a total of 91 notations related to ineffective elimination behaviors during the study.

Sensory deficits. Nurses documented a total of 42 notations of ineffective sensory behaviors during the study. A single notation was recorded on 15 patient records by the nurse completing the nursing assessment. Ten patients were noted to "wear glasses" or to "require glasses for reading." This was their only sensory deficit. Nurses reported that one patient was blind in one eye; three patients had some decrease in hearing, in addition to visual deficits; and one patient had a profound hearing loss in addition to bilateral cataracts. There were no notations to indicate that these sensory deficits were problematic during the patients' stay in hospital.

Nurses documented a total of 27 notations of ineffective sensory behaviors in the other five patients. Four patients with a diagnosis of cerebrovascular accident were reported to have decreased sensation in their lower extremities during their first few days in hospital. Two of these patients had mild to severe visual deficits as well. Nurses reported that two patients had visual deficits which interfered with self-care activities. One diabetic patient was "unable to draw up [his] own insulin" due to his poor vision. Nurses reported that a second patient could not "see well enough to measure [out her] nitropaste." She was subsequently changed to an oral vasodilator. A notation regarding this patient's "poor vision" was documented on the nursing care plan throughout most of her stay in hospital, and accounted for almost 31% of all the notations related to sensory deficits.

Communication deficits or language barrier. Nurses documented that six patients demonstrated ineffective behaviors related to communication during the study. The entries ranged from those stating only that the patient had slurred or garbled speech to detailed descriptions of the patient behaviors. One notation indicated that the patient had an "expressive aphasia" and added that he "couldn't remember what to call a bottle but did know what he wanted." Another patient was reported to be "moaning but was unable to state what was wrong." Nurses documented that an aphasic

patient "shakes or nods [his] head in response to questions" and "appears to understand instructions." A notation regarding this patient's "impaired verbal communication" was documented on the nursing care plan throughout his admission. In total, nurses documented 49 notations of ineffective communication.

Dizziness and balance problems. Nurses documented 21 notations in which patients experienced dizziness, or had difficulty in maintaining their balance during the study. Four patients experienced a single episode of dizziness when standing or sitting up. Nurses documented that another patient complained of dizziness and light-headedness throughout his hospital stay. Nurses indicated that this patient was at risk for injury because of his dizziness.

Two patients were reported to lean or fall to one side when sitting or walking. Another patient was reported to lean to the right when ambulating and on one occasion lost his balance and fell when he stood up. This patient was also reported to have three episodes of dizziness. Nurses documented that all three patients also had ineffective behaviors related to mobility and gait. However, the entries related to mobility and gait were distinct from those related to dizziness and balance. The latter clearly indicated problems with proprioception.

Generalized weakness. Nurses documented that 15 patients experienced behaviors indicative of a state of

generalized weakness on 63 occasions during the study. Five patients had a single notation recorded early in their hospitalization, indicating that they were weak, tired, or lethargic. Nurses documented behaviors of generalized weakness on a frequent and recurring basis in the other 10 patients.

Nurses used a variety of terms to describe this state of generalized weakness. Most notations included the words weak, tired, or lethargic, used alone or in combination. Other entries indicated that patients had a "low energy level," were "listless," and had a "lack of energy" and "general fatigue." In some cases, nurses supplemented the use of these terms with more complete descriptions of the patient behaviors. Thus, one patient was reported to be very tired and to be "having difficulty turning in bed." Nurses documented that another patient had been feeling weak for several days and was "talking in a whisper only" and was "unable to sit up...without assistance."

Other physical status behaviors. Nurses again used the terms "sleepy" and "drowsy" on a frequent and recurring basis to describe patient behaviors. One patient was reported to be "groggy." Other patients were reported to be "shaky" and "tremulous" during hospitalization.

Mental Status

Confusion/disorientation. Nine medical patients demonstrated general or periodic confusion, disorientation to person, place or time, or delusions and hallucinatory behaviors during the study. Nurses documented 76 notations of confused or disoriented behaviors in these patients.

Forty-two notations (55.3%) were recorded only on the Clinical Flow Sheet. A checkmark was used on 18 of these occasions to indicate that patients were confused or intermittently confused. Nurses documented a question mark (?) beside the terms confused or intermittently confused in two patients on the other 24 occasions. Narrative notes indicated that one patient "was alert and nodding appropriately," but was "very frustrated by his inability to speak." Other patients who were reported to be confused on the Clinical Flow Sheet were also noted to be "answering questions appropriately" or to be oriented to person, place, and time in the narrative notes.

Nurses documented 34 notations of confused/disoriented behaviors in narrative form in the patient record, almost always in addition to the entry on the Clinical Flow Sheet. These entries ranged from those which stated only that the patient seemed "slightly confused" to lengthy descriptions of the patients' behaviors. One patient was reported to be "hallucinating - states someone is knocking at her window;"

another patient to be "very confused - thinks he is on a boat at sea."

One patient accounted for 21 notations of confused/disoriented behaviors. Many of these notations were recorded only on the Clinical Flow Sheet. The narrative notes indicated that the patient was very forgetful and required frequent reminders about where she was and the reason for her hospitalization. In describing this patient, nurses frequently combined behaviors related to confusion/disorientation and impaired memory/judgment.

Agitation/restlessness. Nurses documented 18 notations of agitated/restless behaviors in nine patients during the study. Fourteen notations were recorded on patients who also experienced confusion and disorientation during admission. Nurses reported that 10 notations of agitation/restlessness occurred on the same day, and often at the same time, as the confused, disoriented, and hallucinatory behaviors. Nurses used the terms "restless, agitated, jittery, and unsettled" to describe these behaviors. Other patients were noted to be "tossing and turning" and to be "in constant motion." One patient was reported to be "up and down to the desk" and eventually "left [the] hospital and took a taxi home."

Impaired memory and judgment. Six patients demonstrated behaviors indicative of impaired memory and judgment on 24 occasions throughout the study. Nurses

reported that two patients had "poor recall" or "loss of short-term memory." These notations appeared to reflect the patients' perceptions of their memory, rather than the nurses' assessment. There were no further notations to indicate that these patients demonstrated any ineffective behaviors related to memory while in hospital. A single notation on another patient record indicated that the patient forgot to carry her nitroglycerine tablets with her when up walking, even though she had been reminded to do so on at least two occasions.

Three patients accounted for 21 notations of impaired memory and judgment. Nurses reported that one patient was unable to follow instructions during a hypoglycemic attack. On three other occasions nurses documented that they reminded the patient about the correct use of a cane and to request assistance when ambulating. Another patient was reported to be "very forgetful" and to have difficulty remembering her cardiac teaching. The third patient accounted for 12 notations of impaired memory and judgment. Nurses documented at length about her "very poor memory," "inability to remember where she is," or to recall past or current events. About half of the notations indicated that the patient was also confused and disoriented. Nurses reported that the patient "remains forgetful - repeats what day is it? confused as to time." Behaviors related to

confusion/disorientation and impaired memory/judgment were not separated in this patient.

Depression. Nurses documented 16 notations of depressed behaviors in medical patients. Three patients were described as being "depressed" or "very depressed" on one or two occasions during their admission. A fourth patient accounted for 12 notations of depressed behaviors. She was reported to be "depressed" on two occasions. Nurses used a narrative format on 10 other occasions to describe her behavior. She was reported to be "weepy" and "wants to know why this happened to her," and to be "very upset and down about everything." These behaviors were considered indicative of depression in a patient with a terminal illness.

Other mental status behaviors. Nurses again used a variety of terms, not included on the Falls Risk Factor Checklist, to describe patient behaviors. Nurses documented that nine patients were "anxious, apprehensive, afraid, scared, concerned, or frightened" about their admission, illness, impending investigations, or discharge. Six patients were reported to be "upset or annoyed" by other patients, their disease, or hospitalization. Four patients were "inappropriate" or "vague" during admission. Nurses documented that three patients were "crying" or "tearful" during admission, in the absence of other behaviors indicative of depression. Two patients were "frustrated" by

their physical limitations. Another patient became "very abusive" at one point during admission, and another was described as being "a little too ambitious" when the nurse discovered him walking without nurse assistance. These behaviors were not cited as falls risk factors in the literature but were used frequently by nurses to describe the patients in this study.

Medication Use and Substance Abuse

Nurses documented a total of 168 notations of medication use in narrative form on the patient record during the study. Home medications and medication allergies were recorded in the Emergency Department and again when patients were admitted to the Intensive Care Unit or a medical ward. Medical patients received a wide variety of medications while in hospital. The administration of per Registered Nurse (prn) medications, especially analgesics, laxatives/purgatives, sedatives/anxiolytics, antiemetics, and vasodilators were recorded most often in narrative form in the patient record. Bronchodilators administered via aerosol or intravenously, unscheduled insulin, and intravenous anticoagulants were also recorded in this manner.

Ten patients (50%) were questioned about their use of alcohol by the nurse completing the nursing assessment. Most patients were reported to drink "socially or seldom."

Nurses reported that one patient "consumed two to three Scotch per day" and had done so for many years. There was no indication that nurses considered any of these to be ineffective behaviors.

Nurses reported that one patient consumed "a small amount of alcohol, yet indicated that this patient had the "potential for DT's (delirium tremens) related to his alcohol abuse." This notation was obviously formulated on the basis of the medical diagnosis (alcoholism), and their assessments (hand tremors, tremulous, shaky), rather than on the information provided by the patient. Another patient, whose assessment of alcohol use was incomplete at the time of admission, was questioned about her use of alcohol when she developed agitated, confused, and hallucinatory behaviors during hospitalization.

Situational Variables Associated with Falls

Use of siderails. Nurses documented notations of siderail use on 290 days while medical patients were in hospital. This represents almost 99% of the total patient days spent in hospital. Siderail usage also represented the highest percentage of all falls risk factors documented by nurses in medical patients. With the exception of one patient, siderails were in use during the patients' entire period of hospitalization. Seventeen patients had siderails in place up to and including the day of discharge. The few

days in the middle of the patients' hospitalization where siderail use was not documented appeared to be a failure on the part of the nurse to do so, rather than the actual non-use of siderails.

Almost all notations of siderail use were recorded on the Clinical Flow Sheet under the section entitled Safety. A few notations, recorded in narrative fashion in the patient record, were prompted by interunit transfers or patient attempts to climb over the siderails. One notation on a patient's nursing care plan indicated that siderails were to be left up at all times to protect the patient from injury.

Use of other restraint devices. Nurses documented the use of other restraint devices in five patients on a total of 20 days during the study. Restraint devices were used for periods ranging from a few minutes or hours in four patients up to 12 days in one patient.

Two patients were restrained with a jacket restraint for short periods of time. One patient was restrained in this manner while up on the commode chair because she was too weak to support herself. The other patient had a jacket restraint applied during the night shift because she was attempting to crawl out of bed. Another patient was restrained in a "geri chair with the table in place" following her elopement from the hospital, and during the period when she was experiencing confusion, agitation, and

hallucinatory behaviors. She also received two doses of an oral neuroleptic agent during this time.

A fourth patient was restrained with a pelvic restraint on five occasions when he was up in a chair. This patient had a right-sided hemiplegia and limited hip flexion due to previous hip surgery. The restraint may have been used to maintain his hips at a 90 degree angle, rather than to restrain him in the chair. The reason for the pelvic restraint was not clear in the nursing documentation.

A fifth patient accounted for 12 of the 20 incidents of documented restraint use. A jacket restraint was used over a period of six days when the patient was confused and agitated and attempting to get out of bed or out of the chair. A pelvic restraint was used in addition to the jacket restraint on three occasions, after the patient had succeeded in removing the jacket restraint while sitting in the chair. Wrist restraints were used on eight occasions to prevent the removal of a nasogastric tube or intravenous line. On two of these occasions, a jacket and/or pelvic restraint was also in use. The patient was on regularly scheduled doses of librium which were documented only on the Medication Profile. All restraints were discontinued when the patient's condition and level of consciousness deteriorated.

Almost all notations of restraint use were documented in narrative form in the patient record, in addition to

being recorded on the Clinical Flow Sheet by means of a checkmark. The entries indicated only that restraints were used. The reason for their use was implied, rather than specifically stated, in the documentation. It appeared that safety (to prevent patients from climbing out of bed or getting out of the chair) and the maintenance of treatments (nasogastric feedings, intravenous therapy) were the reasons for restraint use in medical patients.

Unfamiliar and hazardous environment. Medical patients underwent a larger number of interunit transfers than surgical patients. Nurses documented all interunit transfers in the patient record. However, evidence of orientation to each new environment was lacking or incomplete in several cases. A single entry on two patient records indicated that patients were "not aware" of where they were. Both incidents occurred during the late evening or night hours in patients who were otherwise alert and orientated. Other patients were noted to be "wandering in the hallway" or to be "unaware of their surroundings." However, these notations were used to describe the patients' confusion and disorientation and were, therefore, included under mental status behaviors.

Nurses reported that patients used furniture or ambulatory aids incorrectly on a total of five occasions. One patient walked to the bathroom pushing a chair and slipped to the floor when the chair slid away from him.

This patient was reported to be carrying his quad cane on three subsequent occasions, and nurses reported that the proper technique was reinforced. Nurses also reinforced the proper use of a walker in another patient. There were no other notations to indicate the existence of hazards within the hospital environment.

Summary

Nurses documented a total of 1212 ineffective behaviors related to 20 falls risk factors during the 294 days medical patients were in hospital. Post-operative condition was not applicable to this patient sample. This number represented an average of 4.12 falls risk factor notations per patient day and was higher than that for the surgical sample (3.64 notations per patient day). The number of notations for each falls risk factor, and that number as a percentage of all falls risk factors, are summarized in Table 3.

The use of siderails accounted for 23.92% of all falls risk factor notations, a figure almost identical to that reported in the surgical sample. Nurses reported that siderails and other restraint devices were used to prevent injury in medical patients. Notations related to medications accounted for almost 14% of all falls risk factor notations. Nurses recorded past and present diseases on admission and documented that these medical diagnoses were the stimuli causing patients' altered/impaired

Table 3

Falls Risk Factor Notations Documented in Medical Patients (n = 20)

Falls Risk Factor	No. of Notations	% of Total Falls Risk Notations
Age	27	2.23
History of Falls	31	2.56
Medical Diagnosis	100	8.25
Mobility/Gait	108	8.91
Use of Ambulatory Aids	59	4.87
Alteration in Elimination	91	7.50
Sensory Deficits	42	3.47
Communication/Language	49	4.04
Dizziness/Balance	21	1.73
Generalized Weakness	63	5.20
Confusion/Disorientation	76	6.27
Agitation/Restlessness	18	1.49
Impaired Memory/Judgment	24	1.98
Depression	16	1.32
Medication Use	168	13.86
Substance Abuse	2	0.17
Use of Siderails	290	23.92
Other Restraints	20	1.65
Unfamiliar } Environment	2	0.17
Hazardous } Environment	5	0.41
TOTAL	1212	100.00

mobility, activity intolerance, and altered neurological function.

Physical status behaviors accounted for almost 36% of all falls-related behaviors documented by nurses. Ineffective mobility and gait behaviors accounted for almost 9% of these notations, and ineffective elimination behaviors for almost 8% of the notations. Nurses reported that three quarters of medical patients experienced a state of generalized weakness at some time during their hospitalization.

Eleven percent of all falls risk factor notations were related to mental status. Confused/disoriented behaviors were documented most frequently, followed by behaviors indicative of impaired memory and judgment, agitation/restlessness, and depression. In addition to these notations, nurses used a variety of terms, not identified as falls risk factors, to describe patients' mental status behaviors.

Nurses routinely documented the patients' age at the time of admission, but made only limited reference to this falls risk factor beyond this initial assessment. Nurses reported that four patients had fallen prior to admission, and documented five falls in two patients during hospitalization. This history of falling was documented briefly on one patient's nursing care plan and throughout hospitalization on the second nursing care plan. Notations

related to substance abuse and an unfamiliar or hazardous environment collectively accounted for less than 1% of all falls risk factor notations documented by nurses during the study.

The following section examines how nurses used this assessment data to identify patients at risk to fall.

Identifying Patients at Risk to Fall

Nurses assessed and documented falls-related behaviors and stimuli in medical patients on a regular basis throughout hospitalization. This section addresses the use of that assessment data to identify patients at risk to fall by means of a nursing diagnosis. The experience with the Morse Fall Scale as a means of identifying patients at risk to fall is also described. Finally, comparisons are drawn between these two approaches.

Use of Nursing Diagnosis to Identify Patients at Risk to Fall

Nurses formulated one or more nursing diagnoses on 18 of the 20 medical patients during their hospitalization. A total of 26 nursing diagnoses were documented on the patient records and/or nursing care plans. Most were formulated at the time the patient was admitted to the ward setting and

identified actual problems, or problems which could develop, during the patients' hospitalization.

Eight of the 26 nursing diagnoses related to problems with oxygenation. These were identified as nursing diagnoses, but were actually stated in medical terms in three patients. Three nursing diagnoses were psychological in nature, identifying anxiety and dysfunctional grieving as problems to be addressed. Two nursing diagnoses cited an alteration in neurological function as the ineffective behavior and the medical diagnosis as the stimuli causing these behaviors. One nursing diagnosis each identified hemorrhage, pain, fluid volume deficit, activity intolerance, impaired verbal communication, delirium tremens, an alteration in nutrition, and a self-care deficit as actual or potential problems during hospitalization.

Five nursing diagnoses appeared to meet the criteria for a falls-related nursing diagnosis. All were documented at the time the patient was admitted and all were transcribed onto the nursing care plan to assist nurses in planning care throughout the patients' hospitalization. Two nursing diagnoses indicated that patients had impaired or altered mobility. Another stated that the patient had a left-sided weakness. Nurses cited the patients' admission diagnosis, age, and pre-existing diseases as the stimuli causing these ineffective behaviors.

Goals and nursing actions were identified for each of these nursing diagnoses. The goals were aimed at improving the patients' mobility, strength, and stability. The goals did not specifically address fall prevention but did appear to address concerns about the patients' ability to mobilize within the hospital environment. However, the nursing actions did not include fall prevention strategies; and it was therefore necessary to conclude that these were not falls-related nursing diagnoses.

Two nursing diagnoses were considered to be falls-related. Both identified the patients as having a "potential for injury" and cited the patients' presenting behaviors, weakness of the legs and dizziness, as the stimuli which made these patients vulnerable to injury. The goal in each case was to prevent the patient from injuring himself during hospitalization. Nursing actions included the monitoring of vital signs, encouraging the patient to report all episodes of dizziness, providing assistance to the patient when mobilizing, leaving the call bell within the patient's reach, and using siderails to prevent injury. These nursing actions were considered appropriate fall prevention strategies in these patients. These nursing diagnoses, supported by goals and nursing actions, were accepted as falls-related, even though the term "fall" was never actually documented.

Use of the Morse Fall Scale to Identify Patients at Risk to Fall

Medical patients were not approached to join the study until their transfer to a medical bed, usually one to five days following their presentation in the Emergency Department. The investigator used the Morse Fall Scale to assess medical patients' fall risk on 271 days, commencing when the patients joined the study and continuing up until the time of their discharge or demise, or in the case of two patients, until their length of hospital stay reached 30 days. A total of 520 Morse Fall Scale variables were recorded during these 271 days. These variables, the number of patients exhibiting each variable, the total days on which each variable was present, and each variable as a percentage of all Morse Fall Scale variables are presented in Table 4.

A history of falling accounted for the largest percentage (25.0%) of Morse Fall Scale variables observed in patients during the study. Four patients reported that a fall or collapse brought them into hospital. Two patients reported falling in the week immediately prior to their admission. A seventh patient reported that he had fallen "many times" due to his impaired gait and need for a prosthetic shoe. This variable was scored as positive (25 points) throughout the patients' hospitalization. One

Table 4

Morse Fall Scale Variables Present in Medical Patients (n = 20)

Variable	No. of Patients Exhibiting Variable	Total Days Variable Present	% of Total Morse Fall Scale Variables
History of Falling	8	130	25.0
Secondary Diagnosis	10	114	21.92
Ambulatory Aid	5	70	13.46
Intravenous Therapy/Heparin Lock	13	50	9.62
Gait	13	122	23.46
Mental Status	6	34	6.54

patient fell three times while in hospital. This in itself did not increase his Morse Fall Score as he had already been scored as positive due to his history of falling. Another patient fell on two occasions while in hospital. She had no history of falling prior to admission so was scored as positive immediately after her first fall, and throughout the remainder of her hospitalization.

Nine patients had a secondary diagnosis recorded on the patient record at the time of admission, and another patient had a secondary diagnosis added to the record while in hospital. This variable, once present, scored 15 points.

Five patients used ambulatory aids. Two patients had used canes or walkers prior to admission and resumed the use of these devices following the acute phase of their illness. Two other patients required canes or walkers following cerebrovascular accidents. A fifth patient wore a five inch block on his shoe to correct a deficit in one leg, the result of osteomyelitis in his youth. The investigator considered this to be an ambulatory aid. The use of canes, walkers, and this prosthetic device were scored as 15 points on the Morse Fall Scale. Two patients were observed moving about the room clutching onto furniture for support, and were assigned 30 points for ambulatory aids on these occasions.

Thirteen medical patients received intravenous therapy or medications via a heparin lock on 50 days of the study. This variable scored 20 points on each of these days.

A weak or impaired gait (10 and 20 points) accounted for 23.46% of all the variables observed during the study. Seven patients progressed from a weak gait at the time of entry into the study to a normal gait at the time of discharge. Four patients demonstrated an impaired gait throughout their hospitalization because of their total

dependence on ambulatory aids. Two patients had an impaired gait, but were ambulatory at the time of admission. Their condition deteriorated and they were placed on bedrest or were lifted into the chair by staff. Gait was no longer considered a variable at that time.

Six patients were assessed as having an abnormal mental status and assigned 15 points on each of the 34 days when these behaviors were observed. Two patients were too confused or too forgetful to adhere to their ambulatory orders. Four other patients, although alert, consistently overestimated their abilities or ignored their limitations. One patient accounted for 16 days of such behavior. In spite of three falls and constant reminders to ask for assistance, he continued to overestimate his abilities, in an attempt to regain his former level of independence.

Morse Fall Scores, by subject and by day of admission, are included in Appendix R. One patient had a Morse Fall Score of zero, and two patients a score of 15 at the time of entry into the study. The other 17 patients had Morse Fall Scores which ranged from 20 to 60 at the time of the initial assessment. One patient had a Morse Fall Score of 15 throughout his short hospital stay. Nineteen patients had Morse Fall Scores which varied throughout hospitalization. These 19 patients were at risk to fall for periods ranging from 1 to 29 days ($\bar{x}$ = 10.0; S.D. = 8.62), when 16 was the Morse Fall Score used to establish fall risk. In total,

medical patients were at risk to fall on 190 of the 271 days (70.11%) they were assessed using the Morse Fall Scale.

Twelve patients were discharged from hospital with Morse Fall Scores 5 to 30 points lower than at the time of the initial assessment. These lower scores were the result of improvements in the patients' condition. One patient had a lower Morse Fall Score when discharged from the study because intravenous therapy had been discontinued. Another patient's score decreased as he became unresponsive and bedridden. Four patients were discharged from hospital or from the study with Morse Fall Scores 5 to 50 points higher than at the time of the initial assessment. One patient had fallen in hospital; two patients required ambulatory aids; and the fourth patient used an ambulatory aid, and overestimated his ability to mobilize independently.

Comparing the Two Approaches

Nurses identified two patients as being at risk to fall, based on the criteria established at the outset of this study. A comparison between the use of nursing diagnosis and the Morse Fall Scale, as a means of identifying patients at risk to fall, was limited to these two patients.

The first patient was admitted with multisystem failure. Nurses documented ineffective behaviors related to 13 of the 20 falls risk factors in this patient, for a total

of 106 notations, or an average of 5.89 notations per patient day ($\bar{x}$ = 3.87; S.D. 1.43).

Age, visual deficits, dizziness, and the excessive use of alcohol were each recorded on one occasion; the presence of multiple diagnoses and the use and administration of medications on two and three occasions. Notations regarding ineffective communication behaviors were recorded on seven occasions. Sixteen notations indicated that the patient was confused or disoriented, and seven indicated that he was also agitated and restless. However, 12 of the notations regarding confusion/disorientation were accompanied by a question mark (?), suggesting that nurses were uncertain about this patient's mental status. The presence of a foley catheter (altered elimination), and the use of siderails were each documented on 18 occasions. There were 12 notations indicating that other restraints were also in use. The falls-related nursing diagnosis cited only "weakness of [the] legs" as the ineffective behavior which made the patient vulnerable for injury during hospitalization (18 notations).

This patient was at risk to fall throughout his hospital stay, based on his Morse Fall Scores. His score was 60 on initial assessment, due to the presence of a secondary diagnosis, a history of falling, and intravenous therapy. His scores increased to 75 and 95 on four occasions when an impaired gait and an abnormal mental

status were also present. His scores decreased to 40 prior to his demise. His mean Morse Fall Score during admission was 62.5 ($\bar{x}$ = 31.93; S.D. = 25.07 for medical sample). He was assessed on 16 occasions and was at risk to fall on all 16 days, when a score of 16 was used to establish fall risk.

Nurses identified a second patient as having a "potential for injury" as a result of his dizziness (5 notations). Nurses documented six other falls risk factors in this patient. There was one notation each related to age, visual deficits, altered elimination, and medication use, and five notations regarding the use of siderails. Fifteen notations were recorded during this patient's short hospital stay, an average of 3.75 notations per patient day ($\bar{x}$ = 3.87; S.D. = 1.43). This patient was assessed on three occasions using the Morse Fall Scale. His score was 15 on each occasion, based on the presence of a secondary diagnosis. He was never considered at risk to fall.

Neither of these patients fell during the study.

Two patients did fall on a total of five days of the study. Both patients had Morse Fall Scores greater than 16 throughout their hospitalization, and were therefore at risk to fall on each occasion. Nurses had not identified either of these patients as being at risk to fall by means of a nursing diagnosis.

Summary

Nurses identified two patients as being at risk for injury and cited dizziness and weakness of the legs as the causative stimuli. The nursing diagnoses were supported by goals and fall prevention strategies.

Nineteen medical patients were at risk to fall on a total of 190 days when a Morse Fall Score of 16 was used to establish fall risk. A history of falling accounted for 25% of the variables observed in this sample, closely followed by gait and the presence of a secondary diagnosis.

Two patients fell during the study. Nurses had not identified either patient as being at risk to fall. Both patients were considered at risk to fall when assessed using the Morse Fall Scale.

Outcomes - Patient Falls

Five patient falls were recorded during the 294 days medical patients were in hospital. Based on these figures, the fall rate would be 17 falls per 1,000 patient days if projected to a larger patient population.

A 70 year old female fell twice, and an 81 year old male three times during the study. Both patients were admitted with a diagnosis of cerebrovascular accident. The female patient was later found to have brain metastases although the primary lesion was never isolated. The female

patient was located in a private room approximately 15 feet from the central nursing station, and the male patient in a four bed room immediately across from the nursing station. All falls occurred in the patient room or bathroom. Two falls occurred on a Thursday, and one each on Wednesday, Friday, and Sunday.

The female patient fell on two successive days during her second week in hospital. The first fall occurred in mid-afternoon when the patient's son was assisting her to walk from the chair to the bed. The bed slipped and the patient and her son fell to the floor. The patient fell again the following morning while walking to the bathroom with her daughter.

The male patient fell for the first time at 2045 hours during his fourth day in hospital. Nurses found him sitting on the floor in front of the toilet when they entered the bathroom to answer the call light. According to the patient, "his legs gave way" when he reached for the call bell. The second fall occurred at the end of his second week in hospital. This incident occurred at 0830 hours when he was walking from the bathroom to the bed pushing a chair. He fell to the floor when the chair slipped away from him. The patient fell again at the beginning of his third week in hospital, when he stood up at the side of the bed and "lost his balance." The incident report was completed at 2130

hours but the patient indicated that he had fallen earlier and been assisted back into bed by an orderly.

Nurses documented ineffective behaviors related to 11 falls risk factors in the male, and 10 in the female, between the time of admission and the patients' first fall. Both patients were noted to have a marked weakness on one side that interfered with mobility and gait. However, neither patient was clearly identified as being at risk to fall. Nurses reported that both patients were alert and oriented, but required the assistance of one or two people to mobilize, at the time of each fall. Siderails or other restraint devices were not in use at the time any of the falls occurred. None of the falls resulted in any injuries.

The female patient had an impaired gait and, therefore, a Morse Fall Score of 20 prior to her first fall. Her score increased to 45 as a result of a history of falling. The male patient had a score of 40 when first assessed, due to a history of falling and a secondary diagnosis. His scores increased to between 60 and 90 during his hospitalization due to his use of an ambulatory aid, his impaired gait, and his tendency to ignore his activity restrictions. His scores were 60, 75, and 90 before each of his three falls. Both patients were at risk to fall at the time of each fall, when 16 was the Morse Fall Score used to establish fall risk.

Summary

Two medical patients fell five times during the study. Both patients had neurological conditions with motor deficits, but were considered alert and oriented at the time of each fall. Nurses had not identified either patient as being at risk to fall. Both were at risk to fall when a Morse Fall Score of 16 was used to establish fall risk.

All five falls occurred in the patient room, in close proximity to the bed or bathroom. Falls occurred during the first, second, and third weeks of hospitalization. Falls occurred on Wednesday, Thursday, Friday, and Sunday. All falls occurred during the day or evening hours, but none were witnessed by nursing staff. Two falls occurred when family members tried to assist one patient to mobilize, and the other three falls occurred in a patient who tried to function independently. Two falls occurred when hospital equipment failed or was used incorrectly. None of the falls resulted in patient injury.

CHAPTER VII: DISCUSSION

Introduction

This chapter examines the results of the study in light of current practice and the existing patient falls literature. The headings, nursing documentation of falls-related behaviors and stimuli, the use of nursing diagnosis and the Morse Fall Scale to identify patients at risk to fall, and outcomes, in terms of patient falls, are again used to guide the discussion. The comments apply to both the medical and surgical patients, unless stated otherwise. Finally, the limitations of the study are identified.

Nursing Documentation of Falls-Related Behaviors and Stimuli

It has already been established that nurses assessed and documented falls-related behaviors and stimuli on a frequent and recurring basis throughout the study. Because no previous studies have addressed the question of what nurses know about the causes and prevention of falls, it was not possible to compare the results of this study to those of existing studies. Therefore, some general comments are made on several of the falls-related behaviors and stimuli documented by nurses. Other variables are examined in

greater depth, either because they captured a large share of the nursing documentation, have implications for nursing education and practice, or because the investigator assessed a similar variable in study subjects, and can draw comparisons between the nursing documentation and her own findings.

Notations related to age, sensory and communication deficits, alterations in elimination, dizziness and balance problems, generalized weakness, and the post-operative condition accounted for more than one quarter of the falls-related nursing documentation on the patient records and nursing care plans of study subjects. Despite this large number of ineffective behaviors documented by nurses, only one patient was reported to be at risk for injury because of his dizziness. In contrast, nurses reported that age, surgery, the post-operative condition, communication, and hearing deficits were the stimuli causing patients' anxiety, knowledge deficits, impaired mobility, altered elimination, potential hemorrhage, and altered activity. On the basis of these findings, it was necessary to conclude that nurses rarely associated these risk factors with patient falls and injury.

Notations related to medical diagnosis, past illnesses and hospitalizations, and the use and administration of medications accounted for almost 23% of all the falls risk factor notations documented by nurses during the study.

Nurses reported medical diagnoses as the cause of patients' altered gas exchange, pain, neurological dysfunction, altered elimination, fatigue, decreased or altered mobility, and activity intolerance. Nurses documented that medications were effective or ineffective, may have contributed to the patient's confusion, and were withheld due to the patient's drowsiness. Only one patient was considered to be at risk to fall because of his previous cerebrovascular accident and residual hemiplegia. It was again necessary to conclude that nurses seldom considered patients at risk to fall because of their particular diagnosis or the presence of multiple diagnoses, or because of the number and combination of medications received.

Nurses documented the use of at least one siderail in all patients throughout most of their hospitalization. Other restraints were used on a total of 38 days of the study. There was no indication that nurses considered siderails and other restraint devices to be falls risk factors. On the contrary, narrative notes indicated that siderails and other restraints were used to prevent injury in patients who were restless and climbing out of bed. The documentation of siderails and other restraint devices under "Safety" on the Clinical Flow Sheet reinforced this perception. The use of the term safety may be a misnomer in light of the patient falls literature. Investigators reported that between 10 and 100% of falls out of bed

occurred when siderails were in place (Catchen, 1983; Clark, 1985; Innes & Turman, 1983; Morse, Prowse et al., 1985; Walshe & Rosen, 1979). Innes and Turman (1983) reported that 67% of patients who fell out of bed when siderails were raised also had jacket restraints in place. None of the falls which occurred during this study involved the use of siderails or other restraint devices. It was possible that nurses used and monitored siderails and other restraint devices appropriately in this facility.

Confusion/disorientation, agitation/restlessness, impaired memory/judgment, and depression were considered mental status behaviors in this study. The investigator also assessed patients' mental status but did so by determining the patients' self assessment of ability. It was, therefore, not possible to compare the findings. However, some comments about the nursing documentation of these behaviors are indicated.

Nurses had little problem describing confused/disoriented and agitated/restless behaviors in patients with extreme mental status disturbances. Their documentation in these cases was complete and detailed. Nurses must have considered some of these patients at risk to fall because they documented that siderails and other restraint devices were used to prevent injury on several occasions. Nurses had more difficulty in assessing mental status in patients who were marginally or intermittently

confused, had a decreased level of consciousness, or were unable to communicate effectively. Nurses indicated their uncertainty in assessing mental status in these patients by documenting a question mark beside confusion or intermittent confusion on the Clinical Flow Sheet. Furthermore, inconsistencies between the notations on this form and in the narrative notes indicated that nurses were unable to assess these behaviors accurately in some patients. These findings are consistent with those of Clark (1985) and Walshe and Rosen (1979) who questioned nurses' ability to accurately assess mental status.

Agitation/restlessness was not widely cited as a falls risk factor in the literature. It was added to the Falls Risk Factor Checklist at the suggestion of the expert nurses prior to the start of the study. These behaviors were documented in 40% of the patients during the study. Two patients experienced a single episode of agitation/restlessness in the days following their falls. In addition, nurses used a variety of other terms to describe the behaviors experienced by patients during the study. The three patients who fell were reported to be "upset, scared, belligerent, uncooperative, inappropriate, frustrated, vague, and overly ambitious" at some point during their admission. These behaviors may represent other falls risk factors not previously reported in the literature.

The variables, history of falling, gait, and use of ambulatory aids were identified as falls risk factors on both the Falls Risk Factor Checklist and the Morse Fall Scale. Consequently, comparisons are drawn between nurses' documentation and the investigator's findings as they relate to these three variables.

The investigator found that 10 patients had a history of falling prior to admission. Another patient, without a history of falling, fell while in hospital. This variable was scored as positive on the Morse Fall Scale on 159 days while these 11 patients were in hospital. Nurses documented a history of falling in four patients at the time of admission. They reported that two patients had fallen with the onset of acute illness and that this had precipitated their being brought to the Emergency Department. Nurses documented that two other patients had bruises and lacerations as a result of falling in the week prior to admission. One fall prior to admission was documented briefly on the nursing care plan. There was no other indication that nurses considered these patients at risk to fall because of their previous history. Three patients fell on a total of six occasions while in hospital. Nurses documented each fall on the patient record and hospital incident report at the time that it occurred. A notation was added to one nursing care plan, two days after a fall, indicating that the patient was at risk for injury because

of his previous fall. Notations, added to a second patient's nursing care plan, listed the dates of each of his three falls but did not identify him as being at risk for further falls. There were no notations regarding a history of falling on the third patient, beyond the actual documentation of the event in the patient record.

Nurses reported a history of falling on 35 days of the study or approximately 22% of the days that this variable was scored as positive on the Morse Fall Scale. It was obvious that nurses did not routinely question patients about a history of falling at the time of admission. Furthermore, even falls in hospital led nurses to identify patients as being at high risk for further falls in only a limited number of cases. It was therefore necessary to conclude that nurses were not fully aware that a history of falling was a strong indicator of future falls.

One of the limitations in drawing comparisons between the nurses' and the investigator's assessment of gait was that gait was not a constant variable. The investigator assessed gait once in each 24 hour period. Nurses were in a position to assess gait on an ongoing basis throughout this same period. Nevertheless, some comparisons are made on the basis of the number and the nature of the notations documented by nurses.

The investigator assessed the presence of a weak or impaired gait in 31 patients on a total of 247 days. Nurses

documented ineffective mobility/gait behaviors in 23 patients on a total of 133 days. However, only 87 of these nursing notations (35.2%), in 19 subjects, related to patients who had a weak or impaired gait on the Morse Fall Scale. Several notations indicated that patients had difficulties with mobility and gait and described these ineffective behaviors in detail. Other entries indicated that patients were wobbly or unsteady on their feet and should be encouraged to ask for assistance when up walking. These notations suggested that nurses recognized a relationship between ineffective gait behaviors and the risk of injury. However, for the most part, nurses failed to clearly indicate that these patients were at risk to fall. Many entries, which indicated that patients had an altered or impaired gait, were documented only on the nursing care plan. Corresponding entries on the patient record were sporadic in nature and failed to describe the nature of the problem.

The majority of nursing entries on the patient records indicated adaptive mobility and gait behaviors; this is, patients were reported to be walking well. The investigator frequently noted these entries on patients whom she assessed as having a weak or impaired gait on the Morse Fall Scale. Patients either had difficulty rising from the chair, walked with slow, shuffling steps and a stooped posture, or

required the support or assistance of a nurse or ambulatory aid to get about.

On the basis of these findings, one must conclude that nurses either lacked the ability to accurately assess and describe ineffective mobility/gait behaviors, or failed to fully understand the relationship between mobility/gait and patient falls. These findings would seem to support the work of Clark (1985) and Walshe and Rosen (1979) who questioned nurses' ability to accurately assess patients' activity and mobility status.

The investigator and the nurses identified the use of ambulatory aids in 12 patients on almost the same number of days during the study. Nurses documented slightly more incidents of ambulatory aid use because wheelchairs were included on the Falls Risk Factor Checklist but not on the Morse Fall Scale. The majority of nursing entries indicated that patients were up with ambulatory aids and managing well. Nurses reported that two patients used walkers and canes incorrectly, but failed to indicate that the ambulatory aid may be a falls risk factor in these patients.

In summary, nurses recorded numerous falls-related behaviors and stimuli on patients throughout the study. However, only a few notations indicated that nurses perceived these patients to be at risk to fall because of these ineffective behaviors.

Use of Nursing Diagnosis to Identify Patients at Risk to Fall

The previous section looked at nurses' assessments of falls-related behaviors and stimuli and examined the extent to which nurses perceived a relationship between these ineffective behaviors and patient falls. This section examines the use of nursing diagnosis as a means of identifying patients at risk to fall.

Nurses identified a number of actual or potential health problems based on their assessment data and stated these as acceptable nursing diagnoses. The plan of care based on these nursing diagnoses was not as well developed. Goals and nursing actions were not always indicated, nursing diagnoses were outdated in many cases, and there was often no evidence of problem resolution. Johnson (1989) reported similar findings, and indicated that nurses documented what they did for patients but that this documentation did not necessarily portray nursing practice based on the nursing process.

Nurses documented nearly 2,000 notations of falls-related behaviors and stimuli during the study. Only four falls-related nursing diagnoses were formulated from this assessment data. Three patients were identified as being at risk to fall. During the study nurses documented between 7 and 16 different falls risk factors in these three patients.

However, in formulating the falls-related nursing diagnoses, they cited only mobility and gait problems, a history of falling, and dizziness as the stimuli which made the patients vulnerable to falling and injuring themselves.

There are several possible explanations as to why falls-related nursing diagnoses were poorly utilized in this study. Firstly, nurses did not fully understand the relationship between these risk factors and patient falls, and therefore failed to recognize these patients as being at risk to fall, even as they assessed and documented ineffective behaviors in many of these areas. Furthermore, nurses failed to recognize the cumulative effect that several of these risk factors could have on fall potential, as evidenced by their citing one falls risk factor in each falls-related nursing diagnosis. Secondly, the Roy Adaptation Model may not adequately address the problem of patient falls. Roy (1984) indicated that activity and rest included the assessment of mobility and gait, and stated that posture was the key to good body mechanics and one's physical safety. However, she did not specifically address patient falls. As a result, the Roy Nursing Assessment Database and orientation sessions to the model may not have adequately addressed the problem of patient falls. Lastly, Johnson (1989) suggested that the lack of a clearly defined taxonomy acceptable to practicing nurses contributed to the relatively poor use of nursing diagnosis. The nursing

diagnosis, "potential for injury," accepted by the North American Nursing Diagnosis Association (NANDA) may not provide practicing nurses with the specificity and direction they need to deal with the problem of patient falls.

While reviewing the falls-related nursing diagnoses, goals, and nursing actions, the investigator noted that nurses employed very few nursing interventions as a means of preventing patient falls. They did not begin to tap the vast number of fall prevention strategies identified in the patient falls literature which would have been appropriate in these patients. This suggested that nurses' knowledge in the area of fall prevention strategies was somewhat limited.

In summary, nurses identified three patients as being at risk to fall by means of a nursing diagnosis. The small number of falls-related nursing diagnoses developed by nurses during the study may reflect a lack of knowledge about the relationship between falls risk factors and patient falls. It may also represent a failure on the part of the Roy Adaptation Model and the NANDA nursing diagnoses to adequately address the problem of patient falls in a way which is meaningful for nurses working in the clinical area.

Use of the Morse Fall Scale to Identify Patients at Risk to Fall

One of the purposes of the study was to utilize the Morse Fall Scale to identify fall-prone patients; to describe the experiences with the instrument; and to determine its potential for identifying patients at risk to fall in an acute care facility, other than the one in which it was developed. The investigator used the Morse Fall Scale on almost 500 occasions over the six and one half months that data were collected. The following comments are based on that experience. The Morse Fall Scale was easy to use and score in the clinical area. Patient assessment using the scale took approximately five to seven minutes each day for each patient. The time required to complete the assessment would be less for nurses in the clinical area who were carrying out the assessment in the process of providing care.

A major advantage of the Morse Fall Scale was the fact that it addressed a manageable number of variables and provided a comprehensive definition of these variables. The descriptions of a normal, weak, and impaired gait were particularly valuable in assessing this variable in patient subjects. The use of specific questions to determine patients' mental status eliminated the uncertainty and subjectivity which can confound the assessment of this

variable. As already indicated, Clark (1985) and Walshe and Rosen (1979) questioned nurses' ability to accurately assess both gait and mental status. The results of this study supported these earlier findings.

Several unusual situations arose during the study and the investigator may have assessed the variables differently than intended by Morse, Morse, and Tylko (1986). They defined a history of falling as an "immediate" history of falls, due to seizure or an impaired gait, prior to admission. Several patients in this study reported falling due to a sudden collapse or impaired gait, in the week prior to hospitalization. These falls were consistently scored as positive in this study. The investigator's interpretation of "immediate" may have been more liberal than that of Morse and her colleagues, and if so, would have contributed to higher Morse Fall Scores, and a larger number of patients at risk to fall. One patient required a five inch prosthetic shoe to correct a deficit in one leg. The investigator considered this to be an ambulatory aid. However, prosthetic devices were not identified on the Morse Fall Scale and this decision may not have been consistent with that of Morse and her colleagues.

The Morse Fall Scale was sensitive to changes in the patients' condition, as evidenced by the variability in daily scores. This was particularly evident in the surgical patients and was consistent with the findings of Morse,

Black et al. (1989). Scores varied less in medical patients, five of whom remained in hospital beyond three weeks awaiting transfer to a palliative or rehabilitative bed, or placement in a long term care facility. Overall, scores increased due to the establishment of intravenous therapy, the use of ambulatory aids, and a deterioration in gait or mental status. Only one patient's Morse Fall Score increased as a result of a fall in hospital. Five patients' scores increased after a secondary diagnosis was added to their record during hospitalization. Morse Fall Scores decreased due to the maintenance of bedrest during the immediate post-operative period, improvements in mental status and gait, and the discontinuation of intravenous therapy.

The mean Morse Fall Score of patients in this study was 29.70 (S.D. = 23.19). Morse, Black et al. (1989) reported their mean score to be 24.78 (S.D. = 22.95) among all patients in an acute care setting. Not surprisingly, the mean Morse Fall Score was higher in this study where all patients were over the age of 65 years.

Patients in this study were at risk to fall on 352 days, when 16 was the Morse Fall Score used to establish fall risk. This represented almost 71% of the total days patients were assessed using the scale. All patients who fell had Morse Fall Scores greater than 16 prior to the fall, and therefore were considered at risk to fall.

However, many other patients, who did not fall during the study, were also identified as being fall-prone.

Most facilities do not have the human and physical resources needed to implement fall prevention strategies on greater than 70% of the days patients spend in hospital. The Morse Fall Scale permits each facility to establish the score at which patients will be considered fall-prone, based on their patient population and the resources available for fall prevention. Morse, Black et al. (1989) identified different levels of risk in their later writings. Patients with Morse Fall Scores of 20 or less were considered at low risk to fall; those with scores between 25 and 40, at medium risk; and those with scores of 45 or more, at high risk to fall. The following discussion examines the impact of selecting each of these values to establish fall risk on the patients in this study.

Patients would be at low risk to fall on 186 occasions, or 37.42% of the time they were assessed using the Morse Fall Scale. Ten patients, with an intravenous in place, were at risk to fall on 29 days when a score of 16 was used to establish fall risk. These patients would now be considered at low risk to fall. One patient with a Morse Fall Score of 20 fell during the study, and would have been identified as being at low risk to fall when three levels of fall risk were in place.

Patients had Morse Fall Scores between 25 and 40 on 144 occasions, or 28.97% of all the days on which fall risk was assessed. None of the patients who fell during the study had scores which placed them at medium risk to fall.

Patients had Morse Fall Scores of 45 or more on 167 days or 33.6% of all the days they were assessed. Five of the six falls which occurred during the study did so on days when patients' Morse Fall Scores were 45, 60, 60, 75, and 90. These scores identified these patients as being at high risk to fall.

In summary, the Morse Fall Scale proved to be easy to use and score in the clinical setting. However, a score of 16 was unrealistic as the value to establish fall risk on the study units. At this score, the facility would have to target fall prevention strategies toward patients on more than 70% of the days they were in hospital. A Morse Fall Score of 45 was much more realistic. Under these conditions the facility would have to implement fall prevention strategies on approximately one-third of the days patients were in hospital. The Morse Fall Score was accurate in predicting 83.3% of falls in high risk patients.

Outcomes - Patient Falls

The six falls which occurred during the study would have produced an overall rate of 11.81 falls per 1,000

patient days if projected to a larger patient population. This rate was almost five times that reported by Morse, Morse, and Tylko (1986) in a 1,200 bed general hospital that included patients of all ages. This rate fell somewhere between that reported by Sehested and Severin-Nielsen (1977) in a geriatric hospital in Denmark (7.99 falls per 1,000 patient days), and the rate of 13.22 falls reported by Tinker (1979) on a geriatric unit in Wales (rates calculated by Morse, Tylko, and Dixon (1987) from available data). The high fall rate in this study can be attributed to the older age of the patients, a vulnerable group with regard to patient falls.

Two patients who fell while in hospital had a history of falling prior to admission. Fifty percent of all falls occurred in patients who fell more than once while in hospital. These findings were consistent with those reported by Sehested and Severin-Nielsen (1977) and Berry et al. (1981), and support the general finding that a history of falling is a strong predictor of future falls.

All three patients who fell had a primary or secondary diagnosis of cerebrovascular or neurological disease with a resultant hemiplegia and impaired gait. Catchen (1983), Johnson (1985), Mayo et al. (1989), Mion et al. (1989), Morris and Isaacs (1980), and Swartzbeck and Milligan (1982) also reported falls to be prevalent among patients with cerebrovascular accidents and hemiplegia, and Morse, Tylko,

and Dixon (1987) identified a weak or impaired gait as one of the variables which contributed to falls.

All patients were considered by nurses to be oriented at the time they fell. Other investigators reported that approximately 60% of patients who fell in acute care hospital settings had a normal mental status. However, Clark (1985) and Walshe and Rosen (1979) questioned nurses' ability to accurately assess patients' mental status. This issue has also been raised in this study.

Falls occurred during the first, second, and third weeks of hospitalization, a finding not consistent with those who reported that falls were most common in the first week, and after the third week of hospitalization (Catchen, 1983; Kulikowski, 1979; Manjam & MacKinnon, 1973; Sehested & Severin-Nielsen, 1977; Swartzbeck, 1983). One patient fell just hours after admission. Manjam and MacKinnon (1973) and Morse, Prowse et al. (1985) also reported that falls were common on the first day of admission.

There was no pattern to the time of day or day of the week when falls occurred. Five falls occurred in the patient room, in close proximity to the bed or bathroom. Berry et al. (1981), Lund and Sheafor (1985), and Morgan et. al. (1985) reported similar findings. Three falls were associated with elimination needs: Patients were either in the bathroom, or attempting to go to, or return from, the bathroom. Ashley et al. (1977), Barbieri (1983), Garcia et

al. (1988), Innes and Turman (1983), Sehested and Severin-Nielsen (1977) and Walshe and Rosen (1979) also reported a strong association between elimination needs and patient falls.

None of the falls in this study were witnessed by hospital staff, a finding also reported by Morris and Isaacs (1980) and Morse, Prowse et al. (1985). Siderails or other restraint devices were not implicated in any of the falls in this study. However, three falls involved the use of hospital equipment. Sehested and Severin-Nielsen (1977) also reported that external causes contributed to approximately one half of all fall incidents.

One fall resulted in very minor injuries. This injury rate was lower than that reported in other acute care hospitals and was surprising, given the ages of the patients and their physical disabilities.

In summary, six falls were recorded during this study. The incidence rate was higher but the injury rate lower than that reported in other acute care facilities. For the most part, patient and situational variables were consistent with those reported in the literature.

Limitations of the Study

There were several limitations of the study. One limitation was that data was collected in one institution.

Therefore, generalization to other acute care facilities was not possible. Patient units were not randomly selected but were chosen because they were more likely to admit patients over the age of 65, and because they were considered high risk areas for falls. The exclusion of specialty services (Obstetrics and Gynaecology, Psychiatry, Adolescents and Pediatrics) and adult patients under the age of 65 meant that the sample was also not representative of a typical hospital population.

The use of a purposive sample might have introduced bias because every member of the population from which the sample was drawn did not have an equal chance of being selected. The results, then, are only representative of this sample. Patients who refused to join the study or whose families refused on their behalf, and patients over the age of 65 who were not approached to join the study, may have produced different study results in terms of nursing documentation, falls-related nursing diagnoses, Morse Fall Scores, and patient falls.

A potential limitation of a study related to patient falls was that it would sensitize nurses to be more conscientious in their assessment and documentation of the behaviors and stimuli which predispose patients to falls. The investigator had many years experience as an auditor and had found that nurses' documentation practices were not easily changed. The results would suggest that nurses did

not change their documentation practices and, moreover, were unable to do so because they did not recognize many of the risk factors and their relationship to patient falls.

The sample size was adequate to examine nursing documentation, the use of nursing diagnosis, and the Morse Fall Scale. However, it was small in terms of the outcome of interest, patient falls. This outcome was further complicated by the nature of the data. The number of patient falls per episode of hospitalization is highly skewed, with a high probability of being zero, and a very low probability of being two or more (Raz & Baretich, 1987). Interestingly, two patients who fell in this study did so on two or more occasions. Patient falls also represent just one aspect of the quality of nursing care. Many factors, other than nursing care, contribute to patient falls. The fact remains, however, that nurses are in the best position to identify patients at risk to fall and to implement fall prevention strategies because of their close contact with patients throughout hospitalization.

The study relied on the review of nursing documentation to answer the research questions. Baker (1983) stated that while clinical records offered a basis for efficient review, a potential disadvantage was that records could be incomplete or inaccurate. Nurses may have identified patients at risk to fall and communicated this information to other staff without documenting on the patient record or

nursing care plan. If this was done by means of taped or verbal reports, the information would not have been available to the investigator. The fact remains that nursing diagnosis and care planning are the most efficient and systematic way of defining and organizing knowledge, and communicating this knowledge to other health care providers (Lederer et al., 1986).

Medical patients did not join the study until one to five days following their presentation in the Emergency Department. Information recorded on the nursing care plan during this time and erased or changed prior to the patients' joining the study was lost to the investigator. However, no item of permanent documentation in the patient record was lost.

The study examined a large number of variables (21 falls risk factors) and collected data related to nursing documentation over 508 patient days. This could result in an unmanageable situation if techniques were not used to deal with the data. The investigator had established clear definitions for each of the falls risk variables prior to the start of the study and followed these criteria throughout the data collection period. The Falls Risk Factor Checklist was also reviewed by expert nurses and pre-tested in the clinical area. Reliability was enhanced by having one individual, the investigator, carry out all of the nursing documentation review. The large sample size and

the volume of nursing documentation provided a rich source of data related to the falls risk factors and allowed the investigator to answer the research questions. The techniques described in the data analysis section were immensely helpful in handling this amount of data.

Because data collection continued over an extended period, there were 12 occasions where the investigator was unable to see patients to assess their Morse Fall Scores. On these occasions the score was estimated, based on the previous and subsequent assessments. On two other occasions the investigator asked the head nurse to carry out the Morse Fall Scale assessment, after explaining the scale and carrying out an assessment with the head nurse. These 14 days when the investigator did not personally assess patients' Morse Fall Scores represented 2.82% of all the assessments carried out during the study. Patients were stable on each of these occasions and had reached a plateau in their recovery. However, it was possible that some variable was not detected on these days and this could have altered patients' Morse Fall Scores.

Summary

Nurses assessed and documented many behaviors and stimuli known to contribute to patient falls throughout the study. However, they did not consistently use this

assessment data to identify patients at risk to fall. Some of the reasons that nurses did not use nursing diagnosis as a means of identifying patients at risk to fall are posited. The experience in using the Morse Fall Scale was described, and the potential of this instrument as a means of identifying patients at risk to fall was explored as it applied to the study subjects. The characteristics of patients who fell and the circumstances surrounding patient falls were examined and compared to previous patient falls studies. Finally, the limitations of the study were identified.

CHAPTER VIII: CONCLUSIONS AND RECOMMENDATIONS

The research questions are re-examined in this final chapter, and conclusions are drawn on the basis of the study results. A critique of the conceptual framework is presented, and finally, recommendations for nursing education, nursing research, and nursing practice are addressed.

Conclusions

This descriptive study was developed around five research questions. The first question looked at which falls risk factors (behaviors and stimuli) nurses considered when assessing patients. The results led the investigator to conclude that while nurses assessed many behaviors and stimuli believed to contribute to patient falls, their documentation failed to indicate that they associated these behaviors and stimuli with patient falls the majority of the time. Furthermore, documentation indicated that nurses had particular difficulty assessing and describing behaviors related to mobility and gait, and mental status. This latter finding was similar to that reported by Clark (1985) and Walshe and Rosen (1979).

The second study question looked at which falls risk factors led nurses to formulate a falls-related nursing

diagnosis as a means of identifying patients at risk to fall. A related question addressed the potential of nursing diagnosis as a means of identifying the fall-prone patient. The results indicated that nurses formulated just four falls-related nursing diagnoses and cited only mobility and gait problems, a history of falling, and dizziness as the stimuli which made three patients vulnerable to falls. The investigator concluded that because nurses failed to recognize many of the behaviors and stimuli they assessed as falls risk factors, they were not able to utilize nursing diagnosis effectively as a means of identifying patients at risk to fall. Where used, nursing diagnosis proved to be a very quick and effective means of communicating patients' fall potential to other members of the health team.

The third research question examined the extent to which the Morse Fall Scale was able to identify patients at risk to fall and its potential as a fall scale instrument in an acute care facility. The investigator found that patients in this study were at risk to fall on 352 of the 497 days (70.82%) they were assessed, when 16 was the Morse Fall Score used to establish fall risk. All patients who fell during the study were considered at risk to fall when this value was used to establish fall risk. However, many other patients, who did not fall during the study, were also identified as being at risk. The investigator concluded that by increasing the score used to establish fall risk to

45, the Morse Fall Scale offered considerable potential as an instrument to identify elderly patients at risk to fall on the medical and surgical units included in this study.

The last research question looked at patient falls, the outcome of interest in this study. Based on the small number of falls which occurred during the study, the investigator concluded that the incidence rate was higher, the injury rate lower, and the patient and situational variables similar to that reported in studies carried out in other acute care facilities.

The Conceptual Framework Re-examined

The quality assessment paradigm described by Donabedian (1966) and the Roy Adaptation Nursing Process provided the conceptual framework for this study. The use of siderails and other restraint devices, the presence of an unfamiliar or hazardous environment, and the situational variables surrounding falls were some of the structure criteria monitored in the nursing documentation throughout the study. These structure criteria are frequently reported as falls risk factors in the literature.

Process criteria, specifically the nursing process, was the focus of the study and the means by which the research questions were addressed. The nursing process, as documented in the patient record and on the nursing care

plan, was analyzed to determine the presence of falls-related behaviors and stimuli and falls-related nursing diagnoses. Overall, the Roy Adaptation Model provided a comprehensive tool for nurses to use in assessing, planning, implementing, and evaluating patient care. However, the model did not specifically address patient falls and this may have contributed to nurses' inability to recognize behaviors and stimuli as falls-related and to utilize nursing diagnosis as a means of identifying patients at risk to fall.

Patient falls, the outcome of interest in this study, represented a small but critical aspect of the conceptual framework. As already discussed, nurses, by virtue of their constant interaction with patients, are in the best position to influence this particular outcome of care by accurate identification of patients at risk to fall.

In summary, the quality assessment paradigm and the Roy Adaptation Nursing Process gave direction to the study and permitted the investigator to answer the research questions. Together they were an appropriate framework for a study which examined nurses' ability to assess falls-related behaviors and stimuli and to identify patients at risk to fall in the broad context of quality patient care.

Recommendations for Nursing

The results of this study have several implications for nursing education, research, and practice. Some of the issues to be addressed and directions to be pursued are discussed in this section.

Recommendations for Nursing Education

The results of this study indicated that nurses did not recognize many of the risk factors associated with falls when present in patient subjects, and therefore did not identify these patients as being at risk to fall in the clinical areas. Nurses were also unable to accurately assess behaviors related to gait and mental status, two variables frequently associated with patient falls in the literature.

It is therefore essential that nursing education programs include the physiology of aging in their curricula so that nurses understand the physiological and psychological changes which predispose the elderly to falls. Health care facilities will be dealing with increasing numbers of elderly patients in the future and any attempts to reduce or prevent falls is highly dependent upon knowing and correcting the factors responsible for falls in these individuals (Tideiksaar, 1989). In addition to an awareness of falls risk factors, nurses require more information in

order to better assess behaviors related to gait and mental status. The results of this study also indicated that nurses employed few fall prevention strategies. There is a need to expand this knowledge and to assist nurses to select strategies which have the best probability of achieving the goal of fall prevention. Efforts to improve nurses' understanding of the causes and prevention of falls must begin with the basic nursing education programs and extend to staff education programs in hospitals.

Finally, there is a need for all nurse educators to work with nurses and nursing students to make nursing diagnosis and care planning a meaningful experience in the real world (Johnson, 1989).

Recommendations for Nursing Research

A number of recommendations for future research can be made on the insights gained from this study.

There is a need to examine nurses' knowledge related to patient falls in other acute and long term care facilities. Consideration should be given to using other data collection methods (nurse interviews, questionnaires) to determine what nurses consider to be the risk factors associated with falls. Any decrease in the number of patient falls will only be realized when nurses become more aware of the risk factors associated with falls and are better able to identify patients at risk to fall. Nurse researchers,

working in this area, might consider developing a program to educate staff about the risk factors associated with patient falls. The study could be designed to determine whether such a program was successful in bringing about improvements in the identification of patients at risk to fall, and whether the number of patient falls decreased as a result of the program.

Research is needed to determine which fall prevention strategies work and which do not. An enormous body of literature exists about nursing interventions to prevent falls, but very little of it describes interventions which have been tried and found effective. Many fall prevention programs reported in the literature introduced a number of fall prevention strategies at the same time. Innes and Turman (1983) suggested that facilities implement a limited number of new measures at one time so that it would be possible to determine which were most effective in reducing patient falls.

There is a need to examine the relationship between the use of siderails and other restraint devices and patient falls. In this study, siderails and other restraints were used to prevent falls and patient injury. The literature suggests that these restraint devices not only fail to prevent falls but may contribute to falls and increased injuries (Lynn, 1980; Maciorowski et al., 1988; Spellbring et al., 1988). Hospital incident reports should be examined

to determine the extent to which siderails and other restraints were involved in patient falls. An experimental design could be used to determine the incidence of patient falls and injuries if siderails and/or physical restraints were discontinued on one pilot unit.

Recommendations for Nursing Practice

It has already been established that nurses must become more aware of the causes of patient falls and strategies to prevent falls. Only then will they be able to identify patients at risk to fall in the clinical area and intervene knowledgeably to prevent falls. The following suggestions are made over and above this basic need. The question related to a previous history of falling should be added to the nursing assessment form and nursing care plan. This would alert all staff about patients at high risk for subsequent falls. Nurses require assistance in assessing behaviors related to mobility and gait, and mental status. The definitions provided by Morse, Morse, and Tylko (1986) would assist nurses in assessing and describing these behaviors, especially gait, whether or not the Morse Fall Scale was in use within the facility.

Consideration should be given to the adoption of the Morse Fall Scale as a means of identifying patients at risk to fall. The scale was easy to use and score in the clinical area, and based on this small sample, seemed to

offer hope in identifying patients at high risk to fall. Further study would be required to establish its reliability. The score used to establish fall risk would need to be determined based on the resources available to devote to fall prevention.

The policy regarding the use of siderails and other restraint devices should be reviewed. Standards of care for safety and the prevention of patient falls should be developed (Hendrich, 1988). Consideration should be given to changing the term safety on the Clinical Flow Sheet where siderails and other restraint devices are presently documented.

Nurses should be supported in their use of the Roy Adaptation Model, nursing diagnosis, and nursing care planning. Concurrent audits could be used to determine whether the plan of care was reflected in the nursing documentation and to provide regular feedback to nurses in the clinical areas. Nursing administration should work with nurses to develop nursing care plans which ensure that information is meaningful to the nurses providing the care.

In summary, nursing education, research, and practice can collaborate to ensure that nurses play a major role in the identification of patients at risk to fall, and the reduction of patient falls through appropriate intervention. The benefits include decreased morbidity and mortality for

high risk patients, improved quality of nursing care, and an increased quality of life for the fall-prone individual.

Summary

The research questions were re-examined and conclusions were drawn on the basis of the study results. The conceptual framework was also re-examined. The study gave rise to a number of implications for nursing. Recommendations for nursing education, nursing research, and nursing practice were outlined. These actions were seen as necessary if nurses are to identify patients at risk to fall and intervene knowledgeably to prevent, or reduce, patient falls.

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Appendix A

Letter Requesting Access to Hospital to Conduct Research

#1203-233 Booth Drive
Winnipeg, Manitoba
R3J 3M4

March , 1989

Miss E. Yallowega,
Assistant Executive Director, Nursing
Grace General Hospital
300 Booth Drive
Winnipeg, Manitoba R3J 3M7

Dear Miss Yallowega:

I am a candidate in the Master of Nursing Program at the University of Manitoba and am writing to request access to your facility for research purposes. The purpose of my study is to examine nurses' assessments of patients in relation to their fall risk and to compare these assessments to those made utilizing the Morse Fall Scale. I hope to gain a better understanding of what nurses know about the causes, risk factors and identification of patients at risk to fall.

I would like permission to approach patients aged 65 and older who are admitted or transferred to the general medical and surgical units within the hospital. I would want to visit these patients daily throughout their hospitalization to assess their fall status utilizing the Morse Fall Scale. This will require about five minutes each day and would involve minimal inconvenience to the patient and the nursing staff. Access to the patient's nursing care plan and patient care record would also be required to determine the nurses' assessment of fall risk in these same patients. Should any fall incidents occur among patient subjects during their hospitalization, I would wish to examine the incident report to determine the patient and situational variables surrounding the fall. A copy of my proposal is included for your perusal.

The study will be explained to the patient or the patient's relative in cases where the patient is confused and a written consent will be obtained from the patient or family member. I will inform the patient's attending

physician in writing of the patient's participation in the study.

The study is being supervised by a thesis committee consisting of Dr. Joan Jenkins, Assistant Professor, School of Nursing, University of Manitoba; Dr. Erna Schilder, Associate Professor, School of Nursing, University of Manitoba; and Dr. Colin Powell, Head of Department of Geriatric Medicine, St. Boniface General Hospital and Professor of Medicine, University of Manitoba. Ethical approval for this study will be sought from the Ethical Review Committee, School of Nursing, University of Manitoba. I will submit a copy of their approval to you when the study is accepted.

Data collection should commence in June, 1989 and be completed within three months. A copy of the results of the study will be made available to the facility. If you have any questions once you have read the proposal, please call me at 889-1494. I will be pleased to meet with you at any time to discuss this research project. I look forward to hearing from you.

Sincerely,

Carol Schick, R.N., B.Sc.N.

Appendix B

Head Nurse Information Form

My name is Carol Schick. I am a student in the Master in Nursing Program at the University of Manitoba. I am conducting a study entitled "Identifying Elderly Patients at Risk to Fall Utilizing Nurses' Assessments and the Morse Fall Scale." The study is being supervised by Dr. J. Jenkins at the School of Nursing, University of Manitoba. My purpose in meeting with you today is to explain the study, to seek your permission to conduct the study on your units, and to ask you to approach patients to determine their willingness to participate in the study.

The purpose of the study is to examine what factors nurses consider in assessing patients at risk to fall and to determine if there are better ways to identify these high risk patients. The sample will consist of 20 medical and 20 surgical patients aged 65 years or older. These patients will be randomly selected from all elderly medical and surgical patients admitted or transferred to your units.

I would assess the patient soon after their admission or arrival on the ward and daily throughout their hospitalization using a fall scale instrument called the Morse Fall Scale. This assessment should take less than five minutes, and I will time it so it does not interfere with morning care, treatments, mealtimes, or visiting hours. I would then examine the patient record and nursing care

plan to determine what factors nurses consider in assessing patient's fall risk.

I need your assurance that you will not place increased emphasis on assessments and documentation related to patient's fall risk during the study period. My purpose is not to find fault with what nurses are presently doing. I do hope to gain a better understanding of what nurses consider to be important risk factors contributing to falls.

This study has been approved by the Ethical Review Committee, School of Nursing at the University of Manitoba, and by the Hospital. If patients express a willingness to meet with me, I will be responsible for explaining the study to patients and securing their written consent. Consent will be obtained from the relatives of any patient who is confused or has a questionable mental status. Participation in the study is entirely voluntarily, and patients will be assured that it will not affect the care they receive. They are also able to withdraw from the study at any time. Patients will be identified by a code number known only to the investigator. I will assume responsibility for notifying the attending physician of each patient who agrees to participate in the study. Individual nurses and nursing units will never be identified.

Do you have any questions or concerns about the study? If not, thank you for your time and for considering my request.

Appendix C

Protocol for Approaching Patients

Hello, my name is Carol Schick. I am a student in the Master of Nursing Program at the University of Manitoba. I am looking at the factors that nurses consider when assessing the safety of patients in hospital. I am interested in determining whether there are better ways to provide a safe environment for patients. The study is being supervised by Dr. J. Jenkins at the School of Nursing, University of Manitoba. The hospital has given me permission to carry out this study.

I would like your permission to ask you a few questions today and to have you walk a few steps so that I can observe your gait (if allowed out of bed). I would then come to see you each day while you are in hospital, ask you one or two questions and again observe you walking, if you are allowed to be up. This should not take more than five minutes of your time each day and I will try to arrange my visits so they do not interfere with any treatments you are receiving, your mealtimes, or visiting hours. I will also review your chart each day to see what the nurses have recorded about your condition. Do you have any questions about the study? Would you be willing to participate in the study?

(If yes) I have a consent form that outlines how you were selected for the study and what will be expected from you if you agree to participate in the study. Please take a few moments to read the consent form. If you prefer, I can

go over it with you. I would be pleased to answer any questions you might have. I will leave you my name and phone number so that you can reach me if you have any questions at a later time.

Thank you for your time and for considering my request.

Appendix D

Patient Consent Form

I agree to participate in a study to examine the factors that nurses consider when assessing the safety of patients in hospital. My participation in the study may help to improve the safety and quality of care given to patients. I have received a verbal explanation of the study by the investigator, Carol Schick, who is a graduate student in Nursing at the University of Manitoba. Any questions I had were answered to my satisfaction by the investigator. I am aware that the study has been approved by the Ethical Review Committee, School of Nursing, University of Manitoba and by the hospital. I am also aware that my attending physician will be informed of my participation in the study.

I understand that my name was chosen at random from among all patients age 65 or older who were admitted to the general medical and surgical units within the hospital. I am aware that the investigator will visit me on admission and each day throughout my hospitalization to ask me a few questions and to observe me while I walk a short distance (if I am allowed out of bed). This will take about five minutes each day. I am aware that the investigator will also review my chart to see what the nurses have recorded about my condition.

I know that I will be identified only by a code number and that all information collected during the study will be kept in a locked filing cabinet. The information will be available only to the investigator and her three advisors and will be destroyed one year following the completion of the study.

I understand that my decision to participate is voluntary and that I may withdraw from the study at any time or refuse to answer any questions the investigator might ask me. I understand that my participation or refusal to participate in the study will not affect my care in any way. I have received the investigator's name and phone number and know I can call her if I have any further questions.

My signature indicates that I am informed and that I agree to participate in the study.

_____ _____

Date Signature of Patient

_____

Signature of Investigator

Appendix E

Consent Form for Patient's Family

I agree to allow my relative _____ (patient's name) to participate in a study to examine the factors that nurses consider when assessing the safety of patients in hospital. I am aware that the study has been approved by the Ethical Review Committee, School of Nursing, University of Manitoba and by the hospital. I am also aware that my relative's attending physician will be informed of his/her participation in the study.

I give my permission for the investigator, Carol Schick, a graduate student in nursing at the University of Manitoba, to visit my relative daily throughout his/her admission, to ask a few questions, and to observe him/her walking a short distance each time (if he/she is allowed out of bed). I understand this will take about five minutes each day and will not interfere with any treatments, mealtimes, or visiting hours. I understand the investigator will also review my relative's chart to see what has been recorded about his/her condition.

I understand that all information will be strictly confidential and that my relative will be identified by a code number known only to the investigator. Information collected during the study will be kept in a locked filing cabinet, will be available only to the investigator and her advisory committee and will be destroyed following the completion of the study.

I understand that participation in the study will not affect my relative's care in any way and that I may withdraw my consent at any time. I have received a verbal explanation of the study from the investigator and have had my questions answered to my satisfaction. I have received the investigator's name and phone number and know that I can call her if I have any further questions.

My signature indicates that I have read the consent and am willing to allow my relative to be a participant in the study.

_____ _____

Date Signature of Relative

_____

Relationship

_____

Signature of Investigator

Appendix F

Letter of Approval from Ethical Review Committee

The University of Manitoba

SCHOOL OF NURSING

ETHICAL REVIEW COMMITTEE

Proposal Number N#89/10

Proposal Title: "Identifying Elderly Patients at Risk to Fall Utilizing Nurses' Assessments and the Morse Fall Scale."

Name and Title of Researcher(s): Carol Schick
University of Manitoba
MN Student

Date of Review: May 1, 1989

Decision of Committee: Approved: ✓ Not Approved: _____

Approved upon receipt of the following changes: _____

Approved with the changes submitted on May 29, 1989.

Date: June 14 1989

T. George, RN/PhD / Chairperson
Associate Professor
University of Manitoba
School of Nursing Position

NOTE:

Any significant changes in the proposal should be reported to the Chairperson for the Ethical Review Committee's consideration, in advance of implementation of such changes.

Appendix G

Letter of Approval from Hospital to Conduct Research

WILLIAM BOOTH . . . . . FOUNDER
EVA BURROWS . . . . . GENERAL
JOHN D. WALDRON . . TERRITORIAL COMMANDER

THE SALVATION ARMY
GRACE GENERAL HOSPITAL

300 BOOTH DRIVE — WINNIPEG, MANITOBA R3J 3M7 — TELEPHONE (204) 837-8311

May 31, 1989

Miss Carol Schick
Director
I.C.U. & Emergency Nursing

Dear Miss Schick:

I am pleased to inform you that your request for conducting a research project in relation to patients at risk to fall has been approved both by Administration and the Medical Executive.

We will be very interested in the results of your findings and look forward to you proceeding with your study here at the Grace Hospital.

Best of luck in your program.

Yours truly,

Elizabeth Yallowega (Miss)
Asst. Executive Director, Nursing

EY/bp

Appendix H

Information for Patient's Attending Physician

Your patient (the relative of your patient) _____ has agreed to participate (has agreed to have the patient participate) in a study entitled "Identifying Elderly Patients at Risk to Fall Utilizing Nurses' Assessments and the Morse Fall Scale." This study is being conducted by Carol Schick who is a student in the Master of Nursing Program at the University of Manitoba. The study has been approved by the hospital and is being supervised by Dr. J. Jenkins at the School of Nursing, University of Manitoba.

Patients, age 65 and over, were selected at random from among all patients in this age group admitted to the general medical and surgical units within the hospital. Patients' involvement in the study will not affect the care they receive.

If you have any concerns or questions about the study, please feel to contact Carol Schick at 889-1494 or local 2163.

Thank you.

Appendix I

Patient Information Form

Code Number _____

Age: _____

Gender: male _____

female _____

Date of Admission: _____

Diagnosis: Primary _____

Secondary _____

Surgery: Procedure _____

Date Performed _____

Date of Discharge: _____

Length of Hospital Stay: _____ (Days)

Appendix J

Falls Risk Factor Checklist

The following risk factors, extracted from an extensive literature review, have been found to be associated with patient falls in a large number of acute care hospital settings.

01 Age greater than 65

02 History of previous falls

03 Mobility or gait problems (including unsteady, weak or impaired gait, decreased mobility or muscle weakness in lower extremities, joint difficulties, amputations)

04 Use of ambulatory assistive devices (including canes, crutches, walkers, wheelchairs, prostheses, furniture)

05 Confusion/disorientation

06 Impaired memory/judgment (including inability to remember/follow directions)

07 Sensory deficits (including decreased sensation in lower extremities, auditory, and visual impairments)

08 Alterations in elimination (urgency, frequency, nocturia, incontinence, urinary catheters, diarrhea, administration of enemas, ostomies)

09 Dizziness/balance problems

010 Agitation/restlessness

011 Generalized weakness (including lethargy, fatigue)

012 Medications (especially when multiple and especially diuretics, anticonvulsants, narcotics, sedatives, hypnotics, psychotropics, tranquilizers, antidepressants, antihypertensives)

013 Substance abuse

014 Depression

015 Post-operative condition (especially within 24-48 hours of surgery)

016 Medical diagnosis (especially when multiple and involving cardiovascular, cerebrovascular or neurological diseases, dementia, and cancer)

017 Communication deficits or language barrier

018 Use of siderails

019 Use of other restraint devices

020 Hazardous environment (unsafe footwear, beds in high position, spills on floor, unlocked wheels on bed/wheelchair, lack of safety rails)

021 Unfamiliarity with environment (due to recent admission, unit transfers)

Appendix K

Data Collection Flow Sheet

Data Collection Flow Sheet

Code Number _____

DATE											
DAY OF ADMISSION											
MORSE FALL SCALE	Score										
	Variables Present										
PATIENT CARE RECORD NURSING CARE PLAN	Behaviors and Stimuli (Fall Risk Factors) Identified										
	Nursing Diagnosis Indicated No - 1 Yes - 2										
	Behaviors and Stimuli (Risk Factors) Identified in Falls Related Nursing Diagnosis										
PATIENT FALLS	No - 1 Yes - 2										

Appendix L

Morse Fall Scale

				Score
1.	History of falling	no	0	
		yes	25	_____
2.	Secondary diagnosis	no	0	
		yes	15	_____
3.	Ambulatory aid			
	none/bedrest/nurse assist/wheelchair		0	
	crutches/cane/walker		15	
	furniture		30	_____
4.	Intravenous therapy/			
	Heparin lock	no	0	
		yes	20	_____
5.	Gait			
	normal/bedrest/wheelchair		0	
	weak		10	
	impaired		20	_____
6.	Mental status			
	oriented to own ability		0	
	overestimates/forgets limitations		15	_____
			TOTAL	_____

Note: From "Development of a Scale to Identify the Fall-Prone Patient" by J. M. Morse, R. M. Morse, & S. J. Tylko, 1986. Unpublished Manuscript, University of Alberta. Reprinted by permission.

Appendix M

Morse Fall Scale - Definition of Variables

History of Falling: Scored as positive if a previous fall was recorded during the present hospital admission, or if there was an immediate history of physiological falls, such as seizures, or an impaired gait, prior to admission.

Secondary Diagnosis: Scored as positive if more than one medical diagnosis was listed on the patient's chart.

Ambulatory aids: Scored as zero if the patient walked without a walking aid, was assisted by a nurse(s), or was immobile or in a wheelchair. A second category was scored if the patient used crutches, a cane or walker, and a third if the patient ambulated clutching onto the furniture for support.

Intravenous Therapy: Scored as positive if the patient had an intravenous apparatus or a heparin lock inserted.

Gait: A normal gait is characterized by the patient walking with head erect, arms swinging freely at the side and striding unhesitantly.

With a weak gait, the patient is able to rise from the chair without assistance. The patient is stooped but is able to lift the head. Support for the furniture/another person is sought, but this is a feather-weight touch, almost for reassurance. Steps are short and the patient may shuffle.

With an impaired gait, the patient may have difficulty rising from the chair, attempting to rise by pushing on the arms of the chair and/or by "bouncing." The patient's head is down, and, as the balance is poor, the patient grasps onto the furniture, a support person, or a walking aid for support, and cannot walk without this assistance. The steps are short, and the patient shuffles.

If the patient was in a wheelchair, the patient was scored according to the gait she/he used when transferring from the chair.

Mental Status: Measured by checking the patient's own self-assessment of ability. The patient was asked if she/he was able to go to the bathroom alone or if she/he needed assistance, or if she/he was permitted up. If the patient's assessment was consistent with the ambulatory orders on the Nursing Care Plan, the patient was rated as normal. If the patient's response was not consistent with these orders, or if the patient's assessment was unrealistic, then the patient was considered to "overestimate his/her own abilities" or to be "forgetful of limitations."

Note: From "Development of a Scale to Identify the Fall-Prone Patient" by J. M. Morse, R. M. Morse, & S. J. Tylko, 1986. Unpublished manuscript, University of Alberta. Reprinted by permission.

Appendix N

Permission to Use Morse Fall Scale

University of Alberta
Edmonton

Faculty of Nursing

Canada T6G 2G3

3-120 Clinical Sciences Building

December 8, 1988

Ms. Carol Schick
1203 - 233 Booth Drive
Winnipeg, Manitoba
R3J 3M4

Dear Carol:

Thank you for your enquiry into the Morse Fall Scale. I will gladly give you my permission to use this instrument in your research, and would appreciate a copy of your findings when completed.

I enclose an article which is in press on the use of the Scale in two institutions. The Scale is also being used at the Charles Camsell Hospital, and is just about to be implemented at the Good Samaritan Hospital in Edmonton.

The article enclosed is further information on the testing of the Fall Scale in regards to validity and reliability.

The Scale is also being tested as a Master's thesis in North Carolina and in other institutions across Canada. At this time I do not know if they have any results or have published anywhere.

Thank you for your interest.

Best wishes,

Janice M. Morse, RN, PhD (Nurs), PhD (Anthro)
Professor and National Health Research Scholar

Encl.
:sap

Appendix O

Patient and Situational Variables Surrounding Falls Form

Code Number _____

Age: _____

Gender: male _____

female _____

Date of Admission: _____

Diagnosis: _____

Surgical Procedure: _____

Date of Surgery: _____

Date and Time of Fall: _____

Patient's Orientation at Time of Fall: _____

Patient's Level of Mobility at Time of Fall: _____

Safety Devices in Use Prior to Fall: _____

Other Factors Contributing to Fall: _____

_____

_____

_____

Injuries Sustained: _____

Morse Fall Scale Score on Admission: _____

Morse Fall Scale Score Prior to Fall: _____

Nurses' Assessment of Patient's Fall Risk on Nursing Care Plan and Patient Record: _____

_____

_____

_____

_____

Appendix P

Hospital Incident Report

Date of Incident _____ Time _____ Exact Location _____

Reported by (Name) _____ Address _____

Status _____ Phone _____

Witnessed by (Name) _____ Address _____

Status _____ Phone _____

Incident to ☐ Patient ☐ Staff ☐ Visitor ☐ Other

ALL ENTRIES MUST BE SIGNED

A. TYPE OF INCIDENT

- ☐ Fall
- ☐ Procedural
- ☐ Treatment
- ☐ Damage to property
- ☐ Loss of property
- ☐ Malfunction of Equipment
- ☐ Hospital security
- ☐ Other _____

B. THOSE NOTIFIED

- ☐ Dept. Head/Supervisor _____
- ☐ Head Nurse/Person in Charge _____
- ☐ Family Physician/Surgeon _____
- ☐ Emergency Physician _____

C. PATIENT RELATED INCIDENTS

Patient Orientation

- ☐ Sedated
- ☐ Orientated
- ☐ Confused
- ☐ Language barrier

Level of Mobility

- ☐ Independent
- ☐ Independent with aids
- ☐ Supervised
- ☐ Assisted by 1 - 2 people
- ☐ Dependent or bedfast

Safety Devices Used

- ☐ Restraints
- ☐ One bedside rail up
- ☐ Both bedside rails up
- ☐ Call bell within reach

Injury Sustained

- ☐ None
- ☐ Lacerations
- ☐ Contusions
- ☐ Fracture
- ☐ Other _____

Treatment Required

- ☐ Cleansing
- ☐ Dressing
- ☐ Suturing

- ☐ Restraints
- ☐ Observation
- ☐ None
- ☐ Other _____

Diagnosis _____

Surgical Procedure _____

_____ Date _____

Form 388109 (9/87)

D. DESCRIPTION OF INCIDENT

E. STATEMENT OF PHYSICIAN

F. ADDITIONAL COMMENTS

Signature (Adm., D.O.N., Dept. Head) _____ Date _____

Original to Administration . . . Copy to Nursing Administration or Department Head.

Appendix Q

Morse Fall Scores (MFS) by Subject and Day of Admission - Surgical Patients

SUBJECT NUMBER	DAY OF ADMISSION ADM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	X MFS
001	60	60	80	80	75	60	60	60																								66.88
003	35	20	50	35	35	35	35	15	35	50	50	50	50	50	50	50	50	50	50	(50)	50	50	50	50	50	50						44.04
004	0	20	30	0	0	0	0																									7.14
009	35	20	20	35	50	50	50	50	50	50																						41.00
0015	35	20	20	55	55	35	35	35	35	35	35																					35.91
0022	25	20	20	35	35	35	35	35	35	35																						31.00
0023	-	25	45	45	65	65	80	50	50	50	50	35	25	25	25	25	25															42.81
0024	0	0	0	0																												0.00
0025	0	20	10	0	0	0	0	0																								3.75
0026	0	20	40	30	0	0	0	0	0																							10.00
0027	0	20	30	30	30	30	30	30	30	10	10																					22.73
0028	0	0	20	40	30	10	10	0	0																							12.22
0029	35	35	35	20	35	35	35																									32.86
0030	0	0	0	0																												0.00
0031	15	15	35	35	55	55	70	50	50	25	15	15	15	15	15																	32.00
0032	0	20	40	20	10	0	0	0	0																							10.00
0033	90	75	95	75	60																											79.00
0034	0	0	20	40	40	40	30	30	0	0	0	0	0	0	0	0																12.50
0035	35	20	35	55	55	35	35	35	35	35	35	40	0	35	35	35	35	35	35	70	70	50	50	*50	*50	(50)	(50)	50	50	50		41.67
0036	0	0	20	40	40	30	55	45	30	0	0																					23.64

0 - MFS estimated

*MFS assessed by delegate

Appendix R

Morse Fall Scores (MFS) by Subject and Day of Admission – Medical Patients

SUBJECT NUMBER	DAY OF ADMISSION																															X MFS
	ADM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
002	–	–	–	–	25	25	25	25	15	15	15	15																				20.00
005	–	20	0	0	0	0	20	0	0	0	0																					4.00
006	–	20	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.00
007	–	–	–	60	60	70	85	85	85	85	85	85	65	55	55																	72.90
008	–	30	30	30	10	0	0	0																								14.29
0010	–	45	25	40	40	40	40																									38.33
0011	–	–	20	20	20	20	20	20	20	20	45	45	(45)	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25.69
0012	–	–	60	95	75	60	60	75	60	60	75	60	60	60	(60)	60	40	40														62.50
0013	–	0	0	0	20	0	0	0	0																							2.50
0014	35	35	35	35	25	25	25	25	25																							29.44
0016	–	–	40	20	20	20	20	65	50	35	35	35	35	35	35	35																34.29
0017	–	–	–	–	20	20	20	20	20	0	0	0	0	0																		10.00
0018	–	–	–	–	–	45	60	60	60	60	60	60	80	45	75	(60)	60	60	60	60	60	60										60.29
0019	–	–	–	40	60	60	60	75	(75)	75	60	75	75	90	90	90	90	75	90	90	(90)	90	90	90	90	90						78.69
0020	–	35	45	45	45	35	(35)	35	35	35	15	15	15	15	15																	30.00
0021	–	–	35	25	25	25	15	15																								23.33
0037	–	–	15	15	15																											15.00
0038	–	35	30																													32.50
0039	–	–	60	75	90	90	90	75	75	75	75	75	75	75	40	75	75	75	(75)	75	75	75	75	75	75	75	(75)	75				74.81
0040	–	–	15	15	25	25	25	25	25	15	0	0	0	0	0	0	0	0	0	0	(0)	0	0									8.10

0 – MFS estimated